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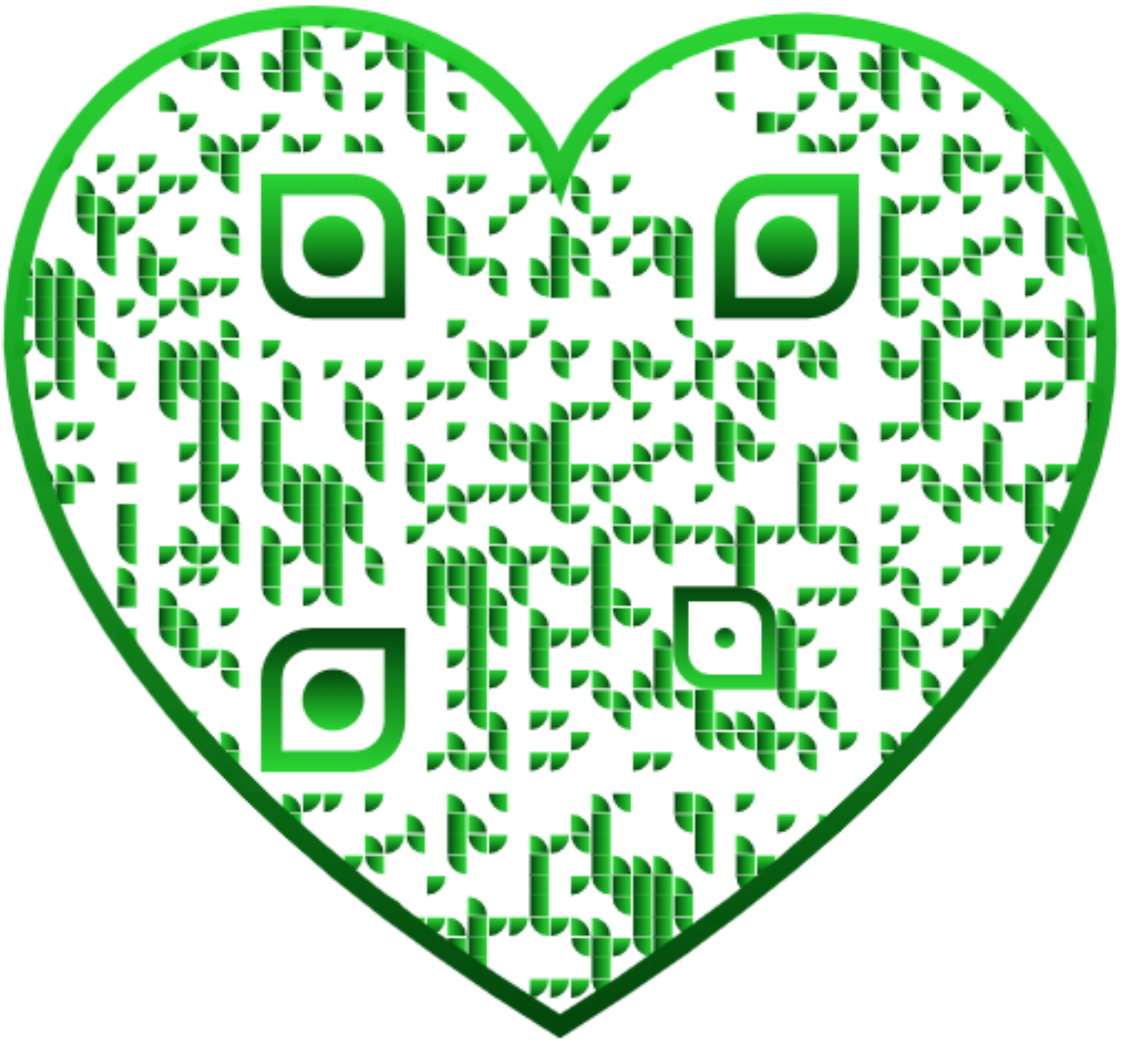

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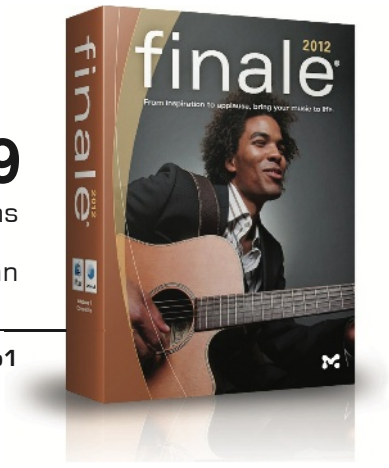

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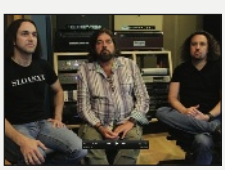
This month...



Alan Parsons and Dave Kerzner talk about Sonic Reality's **Alan Parsons Sample Project**.

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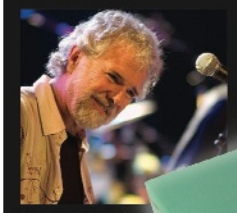
~ Chick Corea



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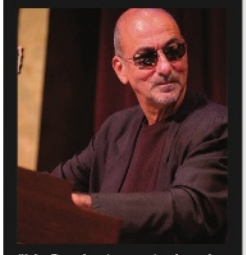

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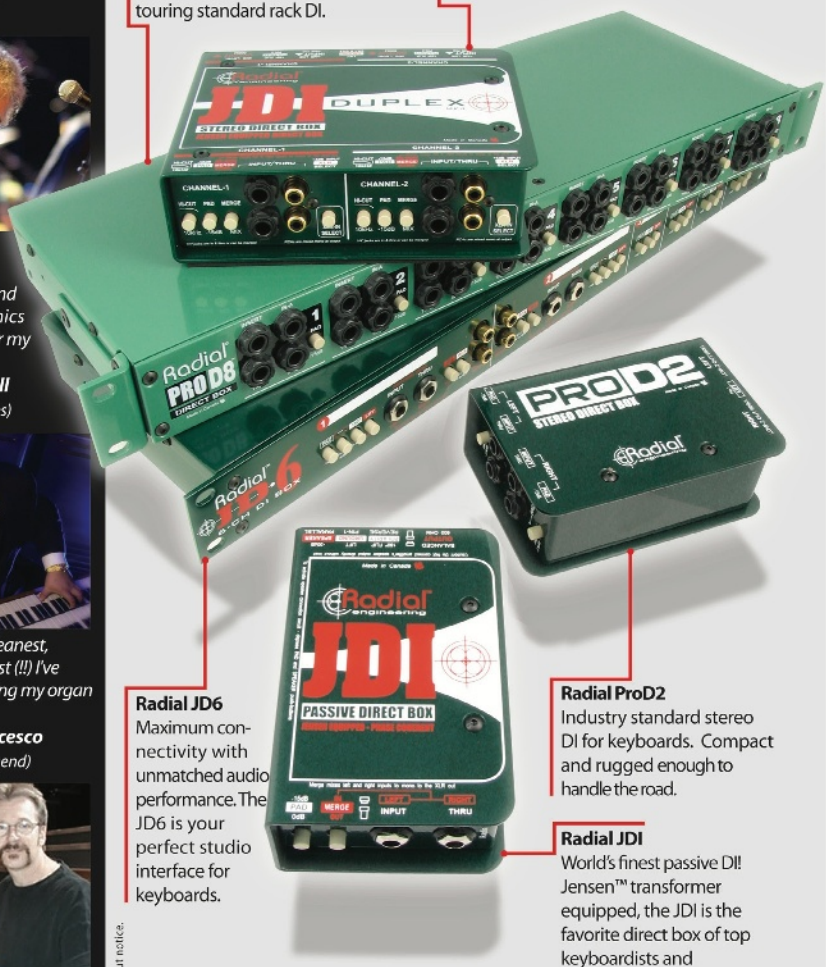

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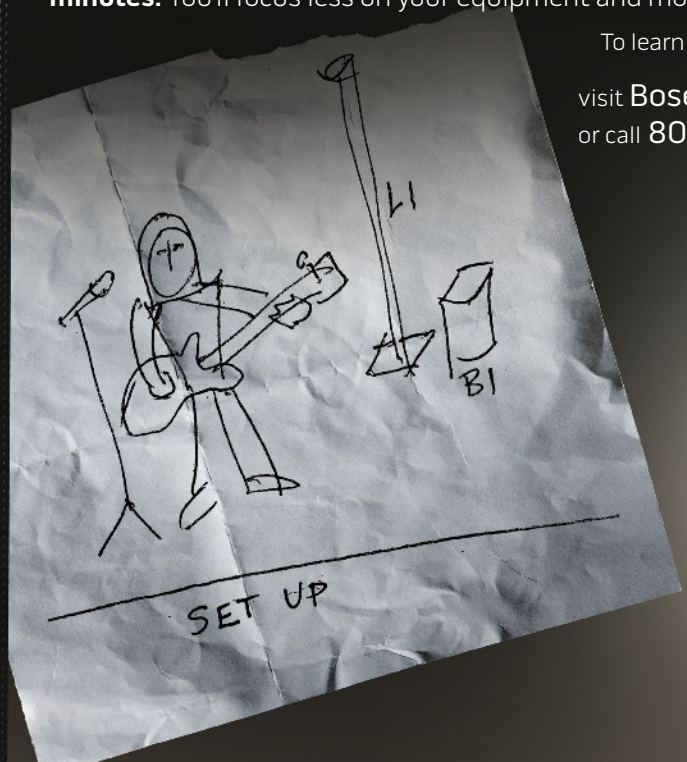

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Editor's Note

It seems like yesterday that I was writing the November 2011 editor's note about how Phish played a benefit concert for recovery from hurricane Irene—which surprised everyone by leaving New York City largely unscathed and walloping further-inland Vermont instead. Superstorm Sandy, of course, was a different story. Many recording studios, gig venues, and community music spaces in lower Manhattan, New Jersey, and Long Island were inundated by water and lost vital equipment. Others lost power and Internet connectivity for a week or more. *Keyboard* itself was without email or phones for a week, and several of our contributors—though thankfully they all remained safe—were similarly offline. That you're holding this issue in your hands is the result of a lot of people working around the clock, and I owe a debt of gratitude to them all.

Musicians have it tough at the best of times, let alone when a natural disaster strikes at their livelihood. MusiCares, the charitable arm of the Recording Academy, has established a fund to help musicians and audio folks affected by Sandy. People have emailed me asking which charities are both music-focused and reputable, and if you have to pick one, this is it. (After Katrina in 2005, MusiCares even made it to New Orleans well ahead of FEMA.) To help, or apply for help if you're in need, go to grammy.org/musicares/hurricane-sandy-relief.

A final note: Sandy has also caused a delay in our tabulating and publishing the results of the 2012 Keyboard Readers' Poll (keyboardmag.com/poll), which was scheduled for this month's issue but will now be seen next month. Until then, be excellent to each other.

Stephen Fortner
Editor

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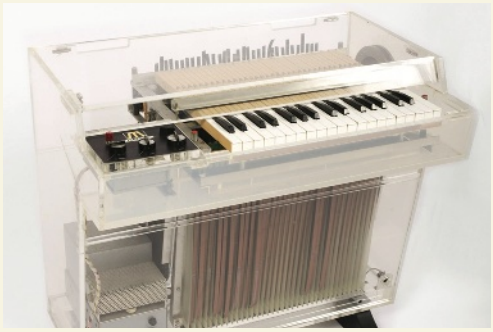
The First Time *I Touched a Synth*.

Bob James

"The first synth I remember playing was a Putney," says Grammy-winning jazz keyboardist and composer Bob James, who encountered the synth—a.k.a. the EMS VCS3—in New York in the late 1960s. "I could modulate it in crazy ways by sticking little push-pins into the holes in a square grid on the console. I felt like a mad scientist!" As the decade changed, so did the instruments Bob found himself playing. "In the early '70s, I started getting calls to play Rhodes, Oberheim, and in the '80s, Yamaha DX7 on studio gigs," he says, "and my keyboard corruption had begun." But the Putney stuck with him as an example of synths done right. "I regretted when the synthesizer eventually evolved into a conventional imitative instrument," he says. Check out Bob's latest album with Fourplay, *Esprit De Four*, on Concord. | **bobjames.com** | Michael Gallant



Transparent plexiglass Mellotron.

ARP 2500 (the *Close Encounters* synth)

The Ondes Martenot, whose sliding ring inspired Analogue Systems' French Connection controller.

Lyle Bell adjusts an EMS Synthi 100 modular.

Hohner Multimonica: a reed organ-plus-sawtooth synth dating back to 1940.

Roger Luther's giant Moog Modular, fully restored.

The Flaming Lips check out a Buchla model 100.

That Belongs in a Museum!

Located in Calgary, Alberta, the **National Music Centre** is Canada's premier organization for music education, outreach, performance, and instrument preservation. They also hold one of the world's largest collections of rare and historical keyboards. Public tours occur Thursdays at 6 p.m. and Sundays at 1:30 and 3:00 p.m. To arrange a private tour, email brandon.smith@nmc.ca. Here's just a little of what you'll see—more at nmc.ca.

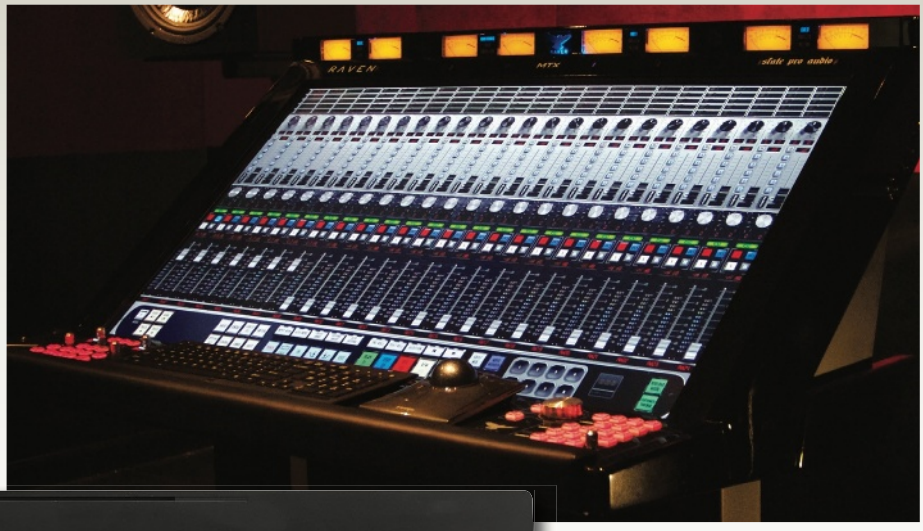
Key Secrets

Creative Tips for Your Gear

Hammond Hauler Yes, it *is* possible for one person to gig with a Hammond organ. Andy Rumelt of funk band Boogaloo Groove hauls his chopped C-3 around in the back of his Subaru. An engineer by day, Andy bought a hydraulic table cart from Harbor Freight Tools ($160 for the 500-pound capacity model). "It works like a barber's chair," he explains. "You pump it with your foot to raise it. The Subaru is just low enough to the ground that, all by myself, I can slide the Hammond into the cargo area." Hear the band in action at Facebook.com/Boogalooatx. David Battino

NEW GEAR

BY STEPHEN FORTNER



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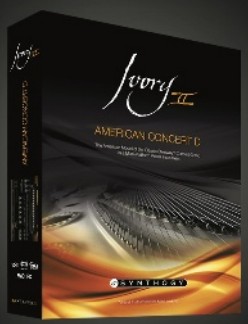

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DONALD FAGEN

INSIDE THE PROCESS

DANNY CLINCH

What do sinewy keyboard lines, nuclear testing, altered chords, delusional jilted lovers, and Igor Stravinsky have in common? They're just some of the interconnected elements on legendary keyboardist and songwriter Donald Fagen's bold new album *Sunken Condos*.

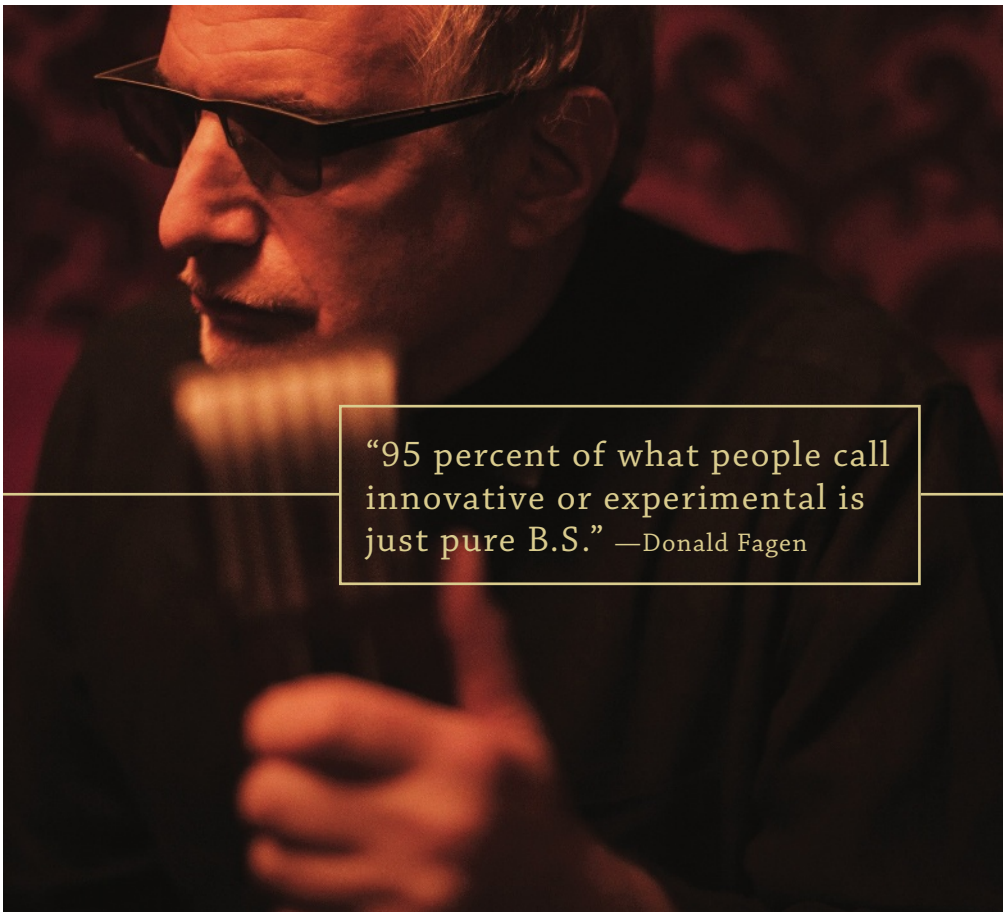
BY JON REGEN

FAGEN'S SIGNATURE STEW OF INFECTIOUS BEATS, UNEXPECTED harmonic motion, sardonic lyrics, and impeccably played instruments has been a force in pop since Steely Dan, the jazz-rock supergroup he co-founded with guitarist Walter Becker, debuted in the early 1970s. Throughout four decades of acclaimed band and solo recordings, the master songwriter has barnstormed across musical styles and lyrical personae.

Now Fagen joins forces with Steely Dan trumpeter and arranger Michael Leonhart to co-produce *Sunken Condos*, a virtuosic romp through humor, history, and heartbreak. A few weeks before the album's release, Fagen and Leonhart sat down to talk about the album's nearly two-year genesis, and in so doing, gave us a rare peek into one of the most hallowed and often misunderstood creative processes in modern music.

Why did you choose Michael Leonhart to co-produce the album?

Donald Fagen: Michael told me numerous times over the years that when I was ready to make a new record, he'd love to help. Although I wasn't really looking for a producer, I told him, "Look, what I really need is someone to sit there when I'm doing the vocals." I usually have Walter Becker sitting there, and when I was doing



Morph the Cat, I found that just having an engineer was a little weird—it's helpful for me to have a *musician* there. But as we got into it, I realized that there were other capacities in which Michael could be really helpful.

How did the two of you divide the labor?

Michael Leonhart: The rhythm arrangements were done, but once we had the drums recorded, we were like, "Okay, if this is what it sounds like now, maybe that bass line doesn't need as many notes" or, "Maybe that guitar part should go like *this* instead."

DF: I may have little ideas for things, but generally speaking, I do horn arrangements after the fact. Once the track is done, that's also when I start getting ideas for vocal backgrounds.

The record is full of Rhodes, Wurly, and Clav, as well Minimoog, Prophet-5, and melodica. What is it about those that still intrigues you?

DF: I like keyboards that sound natural. A lot of it has to do with the fact that I don't like the tuning of synthesizers. A tempered keyboard without stretch tuning makes for problems. The higher you go, the flatter the note becomes, and the lower you go, the sharper it becomes. And even synthesizers that do have some type of stretch tuning still have some peculiar harmonics that don't sound right to me. So I like tunable keyboards. I love Clavinet. It's just funky.

ML: We also happened to find a Clavinet that actually stayed in tune. It was a Hohner E7.

You've talked in the past about using synths to bring out aspects of other instrument parts. Can you speak to that?

DF: They're good for little ornaments, or to thicken things. But I remember when we used to use synthesizers more on different Steely Dan records—like if we were using a high, celeste-type part, we'd have to sharpen it just a little bit. We always had to dick around with the tuning. Some people like the sound of synthesizers, even with their peculiar tuning, because they sound funny or ironic to them. But I'm not really into it. That's Ennio Morricone-ville.

Were any instruments on this record new to you and therefore enjoyable to use?

ML: Because of the way we recorded, we had the luxury of time to make the process as comfortable as possible. In some cases, like when the tuning was off with our Prophet-5, we were able to compare the virtual version from the Arturia V-Collection with the real thing and pick the one we liked better. So it was the best of both worlds.

DF: Michael also has this weird half-sized Japanese vibraphone. It's really cool sounding.

What's your preferred instrument for composing?

DF: I always write on a Yamaha upright piano. When I want to get more into the arranging side of things, I make little demos on [Apple] GarageBand.

"Slinky Thing" has a Clav-driven funk groove, but you expand on it with shifting chord movement. You seem to be saying, "The song has to feel good, but it also has to *go* somewhere."

DF: That's exactly right. I'm just easily bored.

ML: We talked about Igor Stravinsky in this way a number of times—how the magic with him is that you never get bored. His music is always exciting and moving. One of the things that struck me the first time I heard "Slinky Thing" was the end section. Lyrically, it's almost like another song. You don't see that coming, and that's what makes it special.

DF: I thought that song needed a kind of *coda* to comment on the front section.

There's a sneaky, almost vocal-like synth sound on the intro that answers the Clav. What is that?

DF: It's a f***ed-up GarageBand sound that we ended up keeping from the demo. I think it was some kind of marimba. I liked how the decay on it dipped in pitch.

ML: I actually played the same part later on the Prophet-5 and asked Donald if he wanted to replace it. But we both agreed the sound on the demo was better.

Most breakup songs are about how one person can't live without the other. But in "I'm Not the Same Without You," the narrator feels downright superhuman about it. . . .

DF: That song is really a takeoff on certain songs, like "I Will Survive," where the person says, "I'm devastated by this breakup, but I'm gonna keep a stiff upper lip and get through it." I thought it'd be funny if you extrapolated from that idea, so that the person actually starts to mutate into something that's not quite human. Although, it's supposed to make the listener wonder if in fact the guy was *so* devastated that he's become somewhat psychotic. [*Laughs*.] It's the "unreliable narrator" device.

That song has a series of descending *ii-V* changes on the lyrics, "bright arcades in which I bring off heroic escapades."

DF: I still like the cycle of fifths. The composer Bob Telson once gave me a long disquisition on how much he hated it, but I still find it useful once in a while. I mean, it worked for Bach.

But isn't more innovative, unusual harmonic motion a Fagen and Steely Dan hallmark?

DF: It's really not a matter of wanting to inno-

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vate. It's a matter of trying to not fall asleep. When you're making a record, you have to listen to these things hundreds or thousands of times. It's like how sometimes you'll see a film with scenes that are so slow you can hardly pay attention. I always think of directors who had to edit films on a Moviola, staring at those scenes hundreds of times. I wonder, "How can you even stand it?"

ML: You don't shoot *for* innovation—you just try not to be boring.

DF: I have to tell you, it's really just to entertain myself. I think Walter Becker would agree. We always felt a little deficient for not being innovators, in our own minds at least. We loved certain traditions in jazz and R&B, and we used those as our foundation. That's what gives the music *soul*. Maybe what we tried to do was *combine* some things that weren't usually combined. But we never thought of ourselves as innovative. I find that 95 percent of what people call "innovative" or "experimental" is just pure B.S. Most such things are forgotten a year later, because it's often just someone being self-conscious in an attempt to be different. And it usually ends up being really bad.

Is it fair to say that much of your work evinces classical music, where melodic motifs are played, then inverted, then transposed, and otherwise put through their paces?

DF: Yeah. You want to get out of the key and do *something* so you're not just sitting there listening to a static piece of music. That's not to say I don't like the blues, because I do. But you *do* want to hear some development.

ML: One time when we were overdubbing organ parts for "Memorabilia" at my studio, I played something I thought was cool, and Donald said, "No! No *footballs*."

DF: Meaning, a whole-note pad.

ML: Something clicked and I got it. In the architecture of the song and the arrangement, if you start adding these big footballs of keyboards or guitars or horns, it eats up all the space.

DF: There's no air, you know? Then you end up with rock 'n' roll.

ML: That's a classical and a Stravinsky concept—this idea of sculpting space for things to shine through.

DF: Stravinsky is all about air—that's why even if he uses a very large orchestra, it never sounds too heavy.

The drum tracks are credited to "Earl Cooke Jr.," which is actually an alias for Michael Leonhart himself. How did the trumpeter become the drummer as well?

DF: Sometimes when Michael and I were on the road, I'd hear him get behind the drums during sound check and would think, "Wow, that's funky." So when we first started working on the album, I said to him, "You have drums set up at your place. Why don't you just play to the first couple of demos?" And they came out great. So since this particular album has more dancey kinds of grooves and didn't require tremendous technique on the drums, I told him to keep on playing. At that point, Mike was like, "Okay, we'll do some like this, but we'll call in [Steely Dan drummer] Keith Carlock on some others," but we just kept going and Mike ended up doing all of them.

ML: I always thought we'd bring in four or five drummers. Maybe it's because I didn't put a lot of pressure on the situation that I didn't suffocate the music. I just played on some demos, and all of a sudden, we had nine finished tracks.

DF: He had an old-school groove, maybe from being a jazz player. It was just a really comfortable groove that was exactly what the music needed.

The harmonica is a sound you return to again and again. What about it still captivates you?

DF: Well, I always liked Toots Thielmans and I loved Stevie Wonder's playing. I like the harmonica because it's *light* and it can float over a groove. There's something very poignant and childlike about it. Plus I got tired of those same saxophone solos. I wish I could play the harmonica. That's why I play the melodica, but it's not as expressive. So I hire harmonica players.

"Memorabilia" seems to have it all: a monster groove, shifting harmonies, and a startling story. What was its genesis?

DF: Because both Walter and I grew up in the Cold War era, the threat of nuclear holocaust was an everyday thing. It was always being thrown at kids, with "duck and cover" and civil defense drills. Kids in the 1950s—if they were paying attention—sort of took atomic catastrophe as a given. As a kid, I'd heard a story about this one island in the Pacific. The bomb they were testing turned out to be stronger than they thought and it just disintegrated the whole island. So I invented this girl named Ivy King, who's actually named after one of the tests. Ivy collects memorabilia from nuclear tests, and this guy Louie Dakine is a sort of fence for it. Ivy goes to his back room and looks through all his stuff. That's what the song is about.

I think I got the idea from the late friend of my wife. He was a famous sculptor. He lived near Los Alamos and would actually make sculptures out of atomic-era trash he found in the desert, including musical instruments. He once made this huge set of chimes.

What's the Theremin-like sound that comes in on the second verse?

ML: That's a Hammond L-100 organ that I got for 99 bucks! I've always thought that organ is kind of Garth Hudson-ish. It can do a lot of different sounds.

DF: It was perfect for that song. It's very sci-fi sounding, very "Forbidden Planet."

There's a great horn interlude before the last verse of "Weather in My Head" that made me think of Gil Evans. . . .

DF: That's true. It has a very cluster-like harmony like Gil would use. As would Oliver Nelson.

ML: I think it's also reminiscent of Duke Ellington. If you think about his *Far East Suite* or some of his other suites, Duke really does go into that territory.

DF: Ellington liked to put the chord extensions on the bottom. He was one of the first people to actually *not* be afraid of that. I like that sound.

Why did you pick Isaac Hayes' "Out of the Ghetto" as the album's one cover song?

DF: I was researching material for the Dukes of September. [*A live soul revue featuring Fagen, Michael McDonald, and Boz Scaggs. –Ed.*] I came across that tune and realized that for decades, the word "ghetto" has been associated only with the inner city. But it has an older meaning, of course. So we added a Klezmer horn chart, and now the ghetto is back in Warsaw.

On the chorus to "Miss Marlene," the horns really stretch the song's harmonic limits. . . .

DF: Yeah, it almost threatens to go out of the key for a second.

ML: There are actually two sets of background vocals. The first went with Donald's lead vocal behind the line "can you hear the balls rumble" and then he had an idea for response vocals comprised of stacked fifths. I remember thinking, "Whoa, that's out, but is it *too* far out?" But Donald said, "No, it'll be cool." As soon as I heard it, I knew. It's like a beautiful little rub against the harmony that just works.

There's an almost dissonant cluster-chord piano riff that repeats throughout the song "Good Stuff." Where did that come from?

DF: It was just part of the demo. I was trying to create a riff composed of different little parts. To me, when I'm doing that kind of thing, it's sort of equal parts Stravinsky and Sly Stone. It's what people refer to as a *cell:* a one- or two-bar section that's meant to be repeated, but is made up of discrete sounds that form a kind of pattern. I love when all the little pieces are exactly right. It's satisfying in itself.

On a VH1 *Classic Albums* episode, Dean Parks said this about playing in Steely Dan: "Perfection isn't what they're after. They're

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looking for something you want to listen to over and over again. So we'd work *past* perfection until it sounded almost improvised."

DF: Contrary to what Walter and I read all the time, we were never really after perfection. We just wanted the music to sound like what professional jazz people play. I just wanted it to sound *professional*. [*Laughs*.]

ML: I remember when Donald was recording the Rhodes track for "Miss Marlene," he'd sometimes get up and walk around for two minutes. You might think if you just keep on playing a part, it'll get more and more perfect and "on the grid." But that's not how you keep things loose.

DF: Sometimes you're halfway through a song and things start to ossify a little bit. That's when you want to take a break, so you can come back and play the rest and not sound stuck. That's the biggest challenge of recording, especially when you're doing it in layers: to prevent things from sounding stiff or rushed. You have to *not* do something over and over again. A lot of times players will say "Let me do it once more. I can do it *better*." And I'll say, "Well, maybe you *can* do it better, but first you're gonna have some coffee!" Because I can hear when it's not going to get better. So you have to convince people to take breaks.

ML: Those breaks could be from a day to the next, or sometimes Donald would say, "You know what? We're gonna go on the road and do it when we get back." The young, impatient part of me wanted to say, "Why don't we try another take?"

DF: You always want that "first take" feel. That's the challenge of the studio, because you're on a schedule. You're all there, and you're like, "Well, let's finish it!" But sometimes you can't finish it right then *and* have it sound good.

"The New Breed" pits island grooves and sunny chord changes against a sullen story. Is that an intentional dichotomy?

DF: Yes. To me, it indicates that the narrator is on the edge. It's like when someone is in such bad shape that they start *laughing*. It's a sort of "nothing to lose" mindset, so it always makes sense to me to have kind of jolly music when someone's about to lose it.

There are great keyboards on this track as well, including what sounds like a swirling Hammond organ. Was that a real B-3?

ML: It was a *very* real B-3. "The New Breed" actually took awhile because between the two of us, I think we played the main rhythmic keyboard line, "*bup bup, bee-dup*," on Wurly, Rhodes, vibes, and then finally on the Prophet-5.

DF: We went through a lot of different sounds. I wanted everything to feel transparent, like the sonic equivalent of glass—like the *ghost* of a funk tune.

In "The New Breed," you paint the protagonist's romantic rival as very technology-savvy—a hipster I.T. guy. Was this a commentary on something?

DF: Well, at this point I really feel isolated when I'm out in the world. I mean when everyone is just staring at the devices in their hands. I haven't adapted to it very well, I'm afraid. Even if I'm in a cab with someone I've known for years, they don't talk to me anymore. They just look at their palm. They're *palm people*. It's like *Invasion of the Body Snatchers*.

So you have no desire to join the iGeneration?

DF: I think it's part of the dehumanization of the world. But I'm from the '60s, so maybe I'm just not a hep cat anymore. [*Laughs*.] ♫

HAVE YOU SEEN THE MEMORABILIA?

Keys on *Sunken Condos* include: 1. Roland EP-30 above dual-manual Farfisa home organ. 2. Realistic Concertmate MG-1, the "Radio Shack Moog." 3. Author Jon Regen plays the Hammond L-100 used on "Memorabilia" as the Clavinet from "Black Cow" stands on end. 4. Roland Juno-6. 5. Co-producer Michael Leonhart plays Fagen's Prophet-5—the same one used on Steely Dan's *Aja*. 6. Jaymar toy piano and Gakken SX-150 stylus synth atop rare Wurlitzer 106.

See the instruments discussed in this interview in our video visit to Michael Leonhart's studio.
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Jeremy Ruzumna

THROWING DOWN WITH FITZ AND THE TANTRUMS

BY ROBBIE GENNET

RETRO-SOUL SCORCHERS FITZ AND THE TANTRUMS HAVE BEEN BURNING UP late night and daytime TV and club and festival stages all over the world. They even appeared on *Live From Daryl's House*, the online musical jam hosted by Daryl Hall—to whom lead singer Michael "Fitz" Fitzpatrick has been compared more than once. Helming the keyboard chair is the talented Jeremy Ruzumna, whose prior gig was with Macy Gray and included co-writing her debut hit "I Try." We caught up with Ruzumna to find out about their as-yet-untitled upcoming album.

The story goes that Fitz acquired an old organ and found his sound. What was it?
The legend is true! Fitz got an old Conn organ for 50 dollars. That, along with his out-of-tune and beautifully vibey upright piano, became the defining instruments on the first album, *Picking Up the Pieces*. Of course, it's not just the sound of those instruments but also Fitz's oddball and unique way of playing that made that album sound the way it does. Add a wall of sax and flute provided by James King, breakbeats, and my keyboard icing smattered throughout. People love to compare us to Motown, probably because of the horns and the cover art on the first record. But I've always described that first album as an '80s new wave band who went back to the '60s to record their album, then had it mixed by someone from the golden age of hip-hop.

How has the band's sound evolved since that first album?
On the new album, we really made a conscious decision to extend our sound. Keyboard-wise, we used lots of instruments from different eras. A lot of the keyboards came from me taking song files home and lacing the tracks with all of my vintage and analog gear. But just as many came from us at the studio using [Native Instruments] Massive and other soft synths. Also, our producer Tony Hoffer is a master of the Korg MS-20, which plays a large role on this new album. Tony also has a pristine Roland D-50, which we used quite a bit. I remember begging my mom to help me buy one of those back in the day, but I honestly never saw that keyboard becoming cool again.

Fitz plays keys as well, so how do you divide the labor onstage and in the studio?
Fitz has his hands full being the frontman and going crazy all over the stage, so live keyboards have always been my domain. Also, James and I take turns being the "lead guitarist" since there's no actual guitar in this band.

On our new album, Fitz played several of the basic piano parts around which a lot of the songs are built, with me building off that using my vintage synths. Tony sometimes played his MS-20 and found some magical parts with that. In the song "Last Raindrop," there's a dramatic moment at the end of the bridge where Tony put [drummer] John Wicks' long, building drum fill thru the MS-20 and did this crazy resonant sweep, which just really put the thing over the top. "Getaway" originated as a track I did in Logic, built around a beat that I did on my E-mu SP-1200.

Let's talk about gear. . . .
With Macy Gray, I had the luxury of touring with my 1957 Hammond B-3, Leslie 147, Rhodes, and Minimoog. But with FATT it was a total DIY situation, so

Facts and the Tantrums

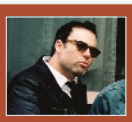
- Billy Preston autographed Jeremy Ruzumna's Hammond B-3 after playing on a song Ruzumna co-wrote with Macy Gray called "Don't Come Around."
- On Jeremy's idols: "I grew up wanting to be Thomas Dolby, Dr. Fink from Prince, and Sly Stone all rolled into one, plus I was into Vangelis and Jean Michel Jarre."
- Ex-Chili Peppers guitarist Arik Marshall, who toured with Jeremy in the Macy Gray band, nicknamed him "Rufus Thomas Dolby."

my setup had to be bare-bones yet great sounding and reliable. It had to be portable, because we set up and break down so often. So, for the last few years my stage setup has mainly been a Nord Wave and Nord Electro 3. I use the Electro for all the B-3, Vox, and Farfisa organs. I use the Wave for upright piano and Mellotron sounds. It's not ideal using the light keys of the Wave for piano, but we manage. Later I added the Nord C1 because it's just so fun to play B-3 on that thing. For bigger shows, we rent an additional Nord Electro and I dump all of my setups into it from a laptop so that in the event of a glitch, we can put it up and keep the show going.

The live setup is going to change. For starters, because there are so many keyboard parts on the new record, we'll be enlisting our sax player James as the second keyboardist. Also, we're in the process of integrating [Apple] MainStage into our rig because it'll basically let us have an unlimited palette of sounds, which we need in order to be able to reproduce the insane amount of keyboards on this new album. ♫

Top to bottom: Minimoog, ARP string ensemble, and Roland Juno-60.

Studio keys, clockwise from left: Rhodes suitcase, Roland Juno-60, Clavia Nord Wave and Nord Electro 3, and Rheem combo organ.



Jeremy talks more about Macy Gray, the Tantrums gig, and his favorite gear in our extended interview.
keyboardmag.com/january2013

5 WAYS TO PLAY LIKE Donald Fagen

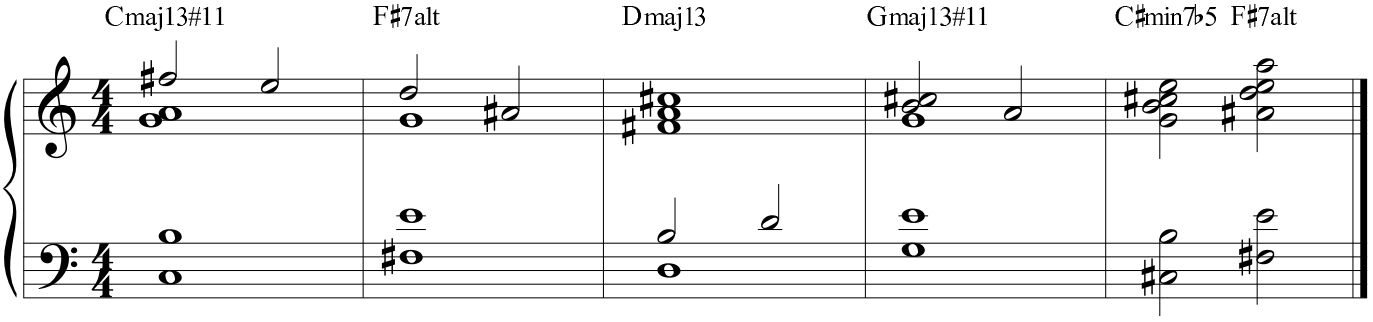
BY BRIAN CHARETTE

FOR OVER 40 YEARS, DONALD FAGEN HAS HAD A MONUMENTAL IMPACT ON modern music. His jazz-tinged songwriting and funky keyboard work helped define the sound of a generation. Largely self-taught, Fagen regularly went to see players like Charles Mingus, Thelonious Monk, and Miles Davis perform during his formative musical years. Those experiences piqued an interest in jazz harmony that continues to this day. Here are five ways to play like this modern keyboard master.

1. Piano Chording

One hallmark of Fagen's musical persona is his deft command of keyboard harmony, demonstrated in **Ex. 1**. He often plays jazz-influenced chord voicings with an abundance of chord extensions in tightly spaced positions. This example is reminiscent of his piano work on his new song "Good Stuff," with intriguing inner motion and chordal tension.

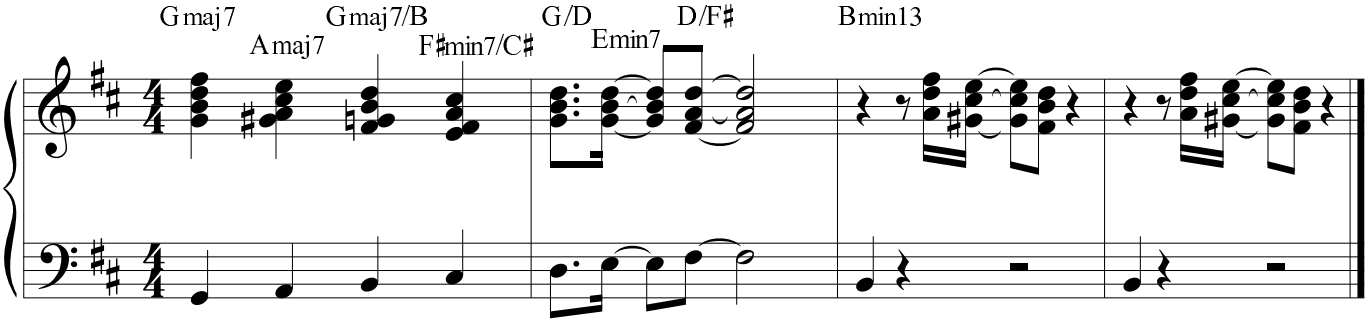
Ex. 1.



2. Wurlitzer and Rhodes Parts

Fagen is a lifelong fan of vintage keyboards like the Rhodes and Wurlitzer electric piano. **Ex. 2** is similar to his Wurly technique on tracks including the bluesy "Weather in My Head," "Jack of Speed" from the Steely Dan album *Two Against Nature*, and more. Bar 1 begins with a modern harmonic approach that includes slash chords, which use a bass note other than the chord root and are a Fagen favorite. Bars 3 and 4 demonstrate the technique of alternating diatonic triads in the Dorian mode for comping over the *B* minor chord.

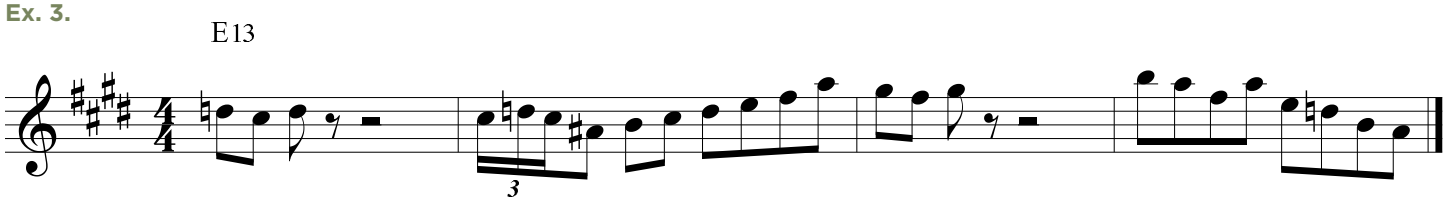
Ex. 2.



3. Melodica Lines

The reedy tone of the melodica, a breath-powered keyboard (Hammond-Suzuki calls their models melodions) appears often in Fagen's work. **Ex. 3** demonstrates his use of that instrument. In bar 1, we have a simple melodic motif that returns in bar 3. Then bar 2 begins with a Charlie Parker-esque bebop phrase that utilizes the notes of the *E* Mixolydian mode as well as the chromatic embellishing tone of *A*♯. Later, bar 4 communicates a pentatonic-flavored idea.

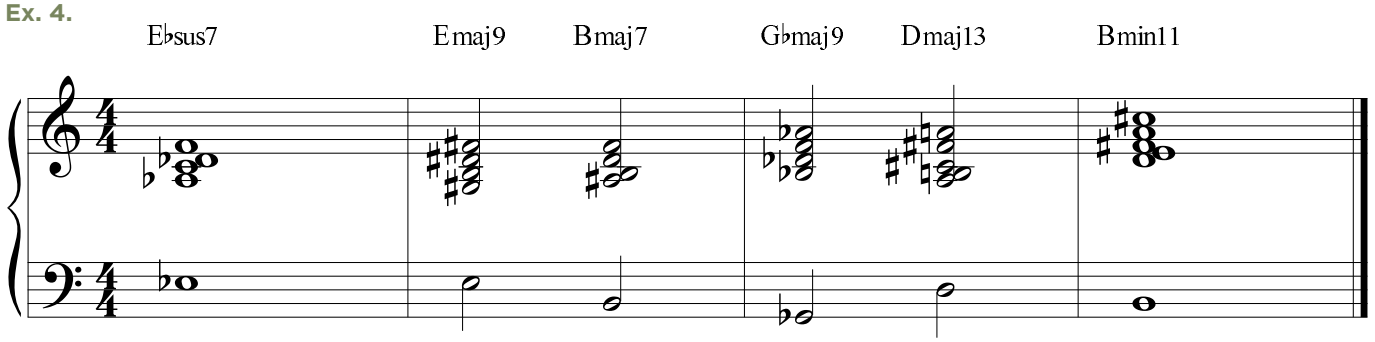
Ex. 3.



4. Complex Harmony

Fagen will often move close-position jazz voicings in fourths and fifths to create interesting harmonic shifts, as seen in **Ex. 4**. Following the initial *E*♭ suspended chord, Fagen uses four different major seventh voicings to take us towards our destination: a *B* minor 11th chord. Try this technique yourself by harmonizing a melody with unusual chords that are *not* diatonically related.

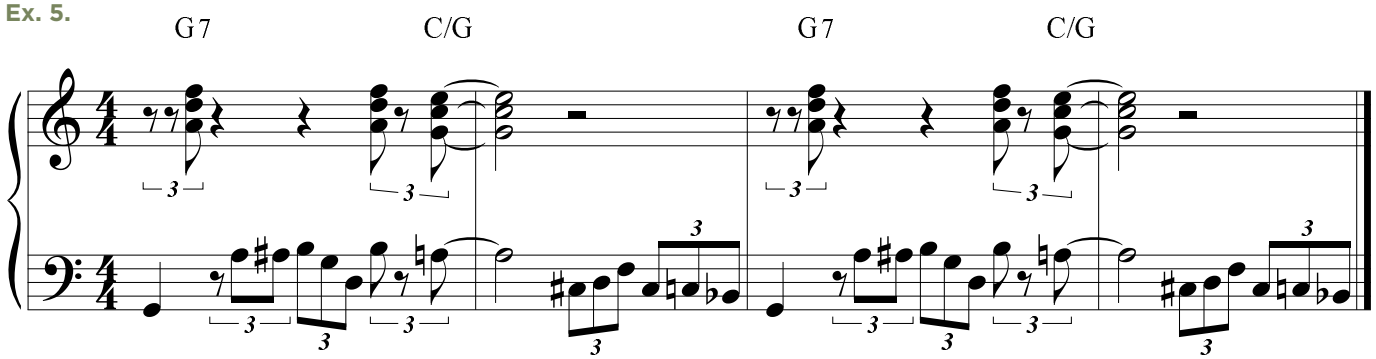
Ex. 4.



5. Rhythmic Clav Riffs

The venerable Hohner Clavinet is another sonic staple in Fagen's music. **Ex. 5** is inspired by new tracks like "Miss Marlene" and classics such as "Black Cow" and "Kid Charlemagne" and demonstrates his penchant for playing rhythmic riffs on the instrument. Notice how the left hand creates a strong counterpoint to the right hand's comping parts.

Ex. 5.



NILS WINTHER

The Simple Behind the Complex

"The key to Donald Fagen's sound is *minimalism*. Though his chord progressions can be complex, he never overplays and always makes his musical parts serve the song," says organist and composer **Brian Charette**, who has performed and recorded with Joni Mitchell, Lou Donaldson, Bucky Pizzarelli, Michael Bublé, and Rufus Wainwright, in addition to leading his own jazz groups. His latest album is *Music For Organ Sextette*, on SteepleChase Records. Find out more at kungfugue.com.

SOUNDCLOUD

Hear Brian play the audio examples from this lesson.
keyboardmag.com/january2013

Contemporary Country Concepts

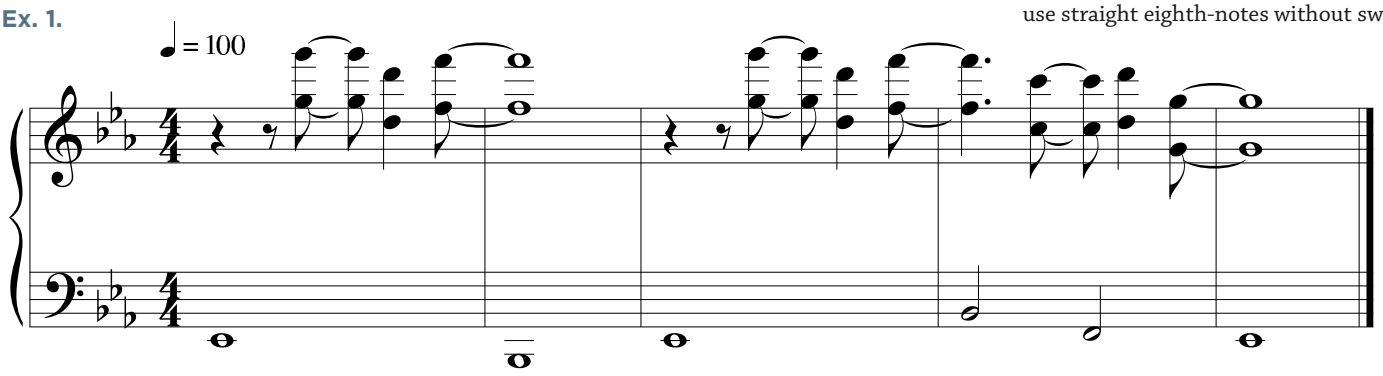
BY JONATHAN HAMBY

COUNTRY MUSIC IS CONSTANTLY EVOLVING AND INCORPORATING NEW influences, but its focus is still on strong songwriting. As a keyboardist, it's important to think about how to add to what the band is playing, and how to support the vocalist without overplaying or detracting from the ensemble's sound. Having had the opportunity to work with and learn from some amazing musicians and vocalists over the years, here are some approaches I might use in different parts of a song.

1. Piano Intros

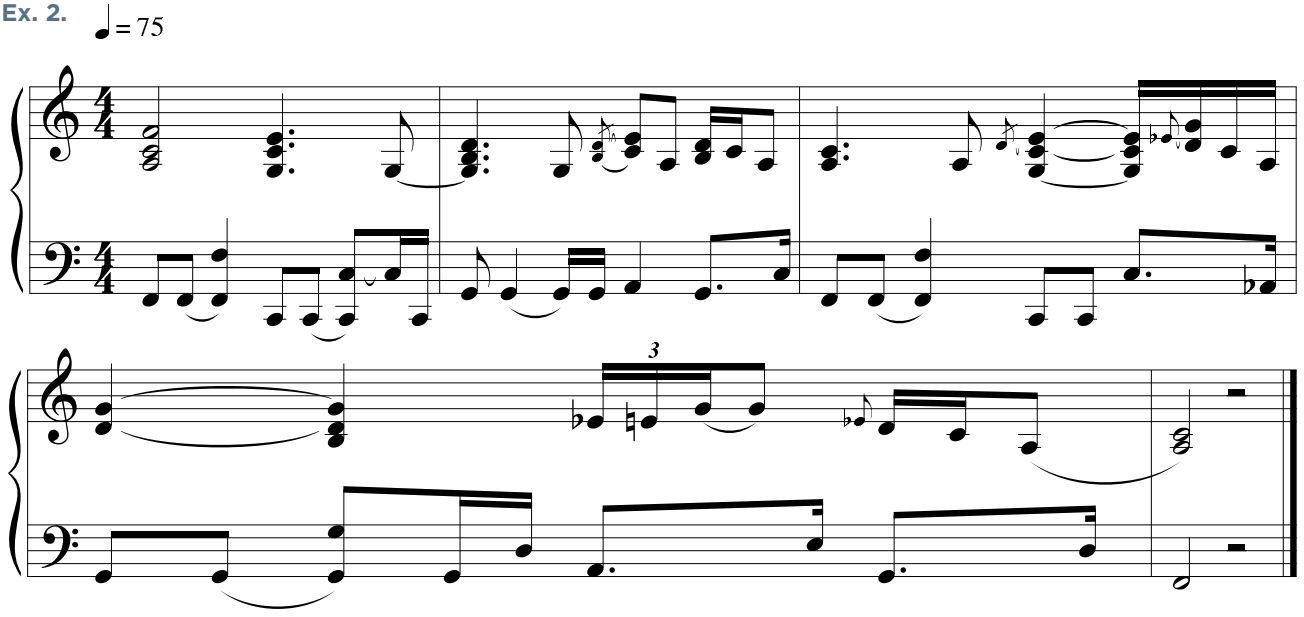
Piano parts in country are becoming more streamlined and hook-oriented, especially the right hand. **Ex. 1** demonstrates this approach using *octaves*. You can also try building sparse piano intros using single-note figures either in the same register or an octave down. There aren't many notes in this example, but the challenge is to play them right in time with the drummer. So use straight eighth-notes without swing.

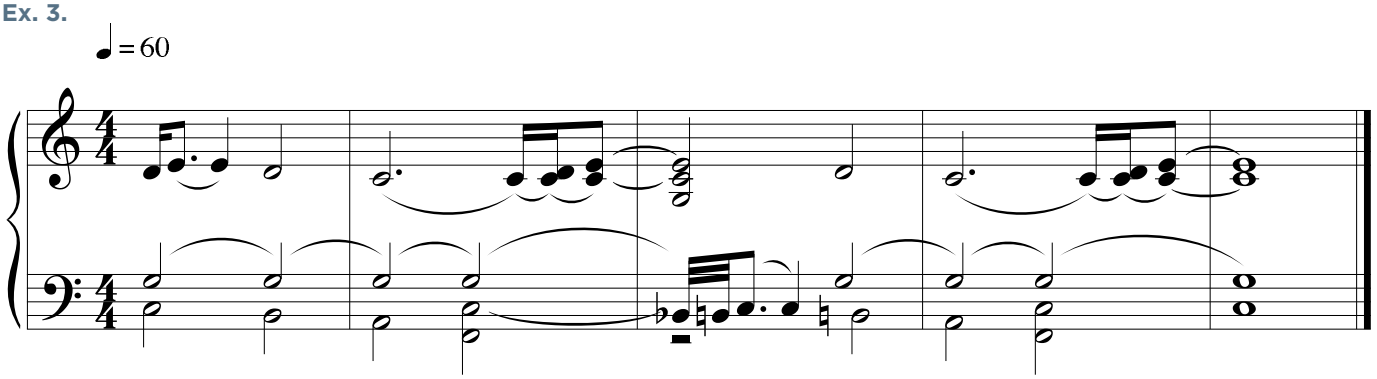
Ex. 1.



2. Wurly Turnarounds

Ex. 2 incorporates Benmont Tench-style "hammer-ons," and sounds great on the Wurlitzer electric piano. Whether you are playing a real one through a combo amp or a plug-in with modeled effects, dial in some overdrive to break the sound up a little. Contrary to the last example, this feel should swing a bit.

Ex. 2.

Ex. 3.



3. Organ Pads in Verses

Often, the simplest part is exactly what a song calls for, as in **Ex. 3**. For a ballad or a verse that's mellow, use just one or two drawbars on your Hammond organ or clonewheel. You can pull out the 8' and 4' drawbars with your Leslie on slow, and use open voicings, especially as you play in lower registers. Use hammer-ons and the expression pedal to help emphasize the beat.

Listen!

"In Nashville currently, you hear an approach to keyboards that's more stripped-down than the traditional [and more flowery] Floyd Cramer piano style," says Nashville keyboardist and producer **Jonathan Hamby**. "That's one reason that the most important skill in country keyboards is listening to others." Hamby has worked with artists including Amy Grant, Peter Cetera, and Carrie Underwood.

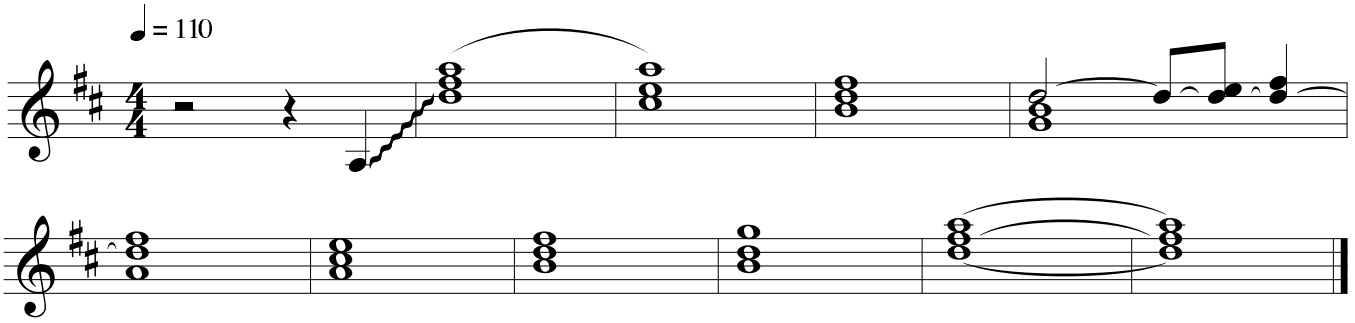
SOUNDCLOUD

Hear Jonathan play "Good Girl" with Carrie Underwood, and get audio examples for this lesson.
keyboardmag.com/january2013

4. Organ Pads in the Chorus

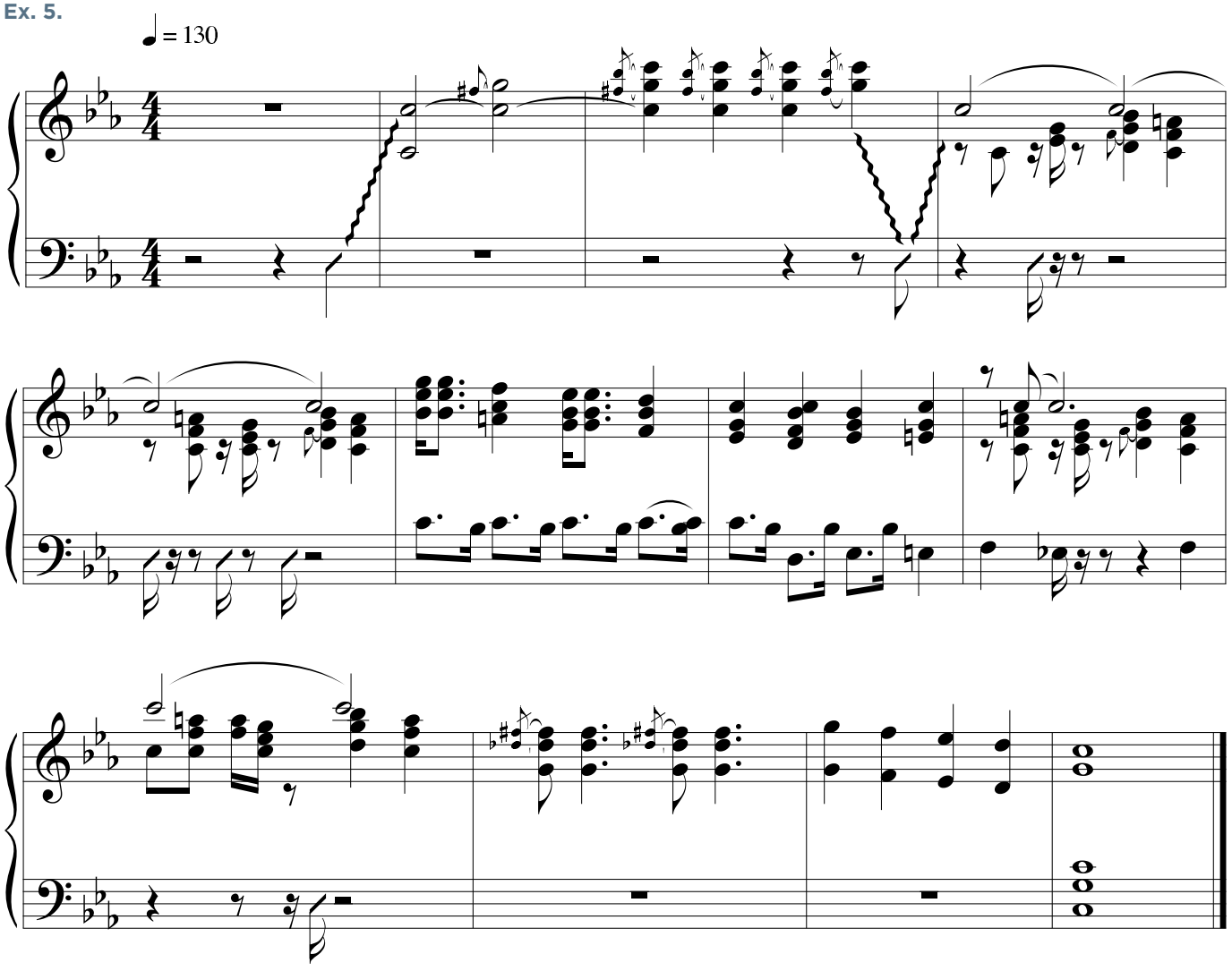
Ex. 4 is more Procul Harum than traditional country, but it works. Always listen for a space to play in that complements but doesn't conflict with other parts, especially the lead vocal. This is something you might play in a chorus or an "up" part of a song. As you play higher on the keyboard, the voicings become closer with first- and second-inversion triads. Pull out more drawbars, turn on the chorus, and/or change the Leslie speed to keep things interesting.

Ex. 4.



5. Organ Solos

Instrumental breaks give you the opportunity to step out. If you're doing a song with a more traditional country feel, you can change things up with some Gospel-influenced Hammond, as in **Ex. 5**. Use your left hand for the glissandi. For left-hand chords, don't overthink which notes you're hitting, as the duration should be short enough to create a percussive sound without actually spelling out a key center. Turn your harmonic percussion on and alternate Leslie speed on sustained notes.

Ex. 5.

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Poster from the late 1930s or early '40s, advertising boogie-woogie legends Albert Ammons, Pete Johnson, and Meade Lux Lewis at New York's Café Society music club.

The Basics of Boogie

PART 2

BY AXEL ZWINGENBERGER

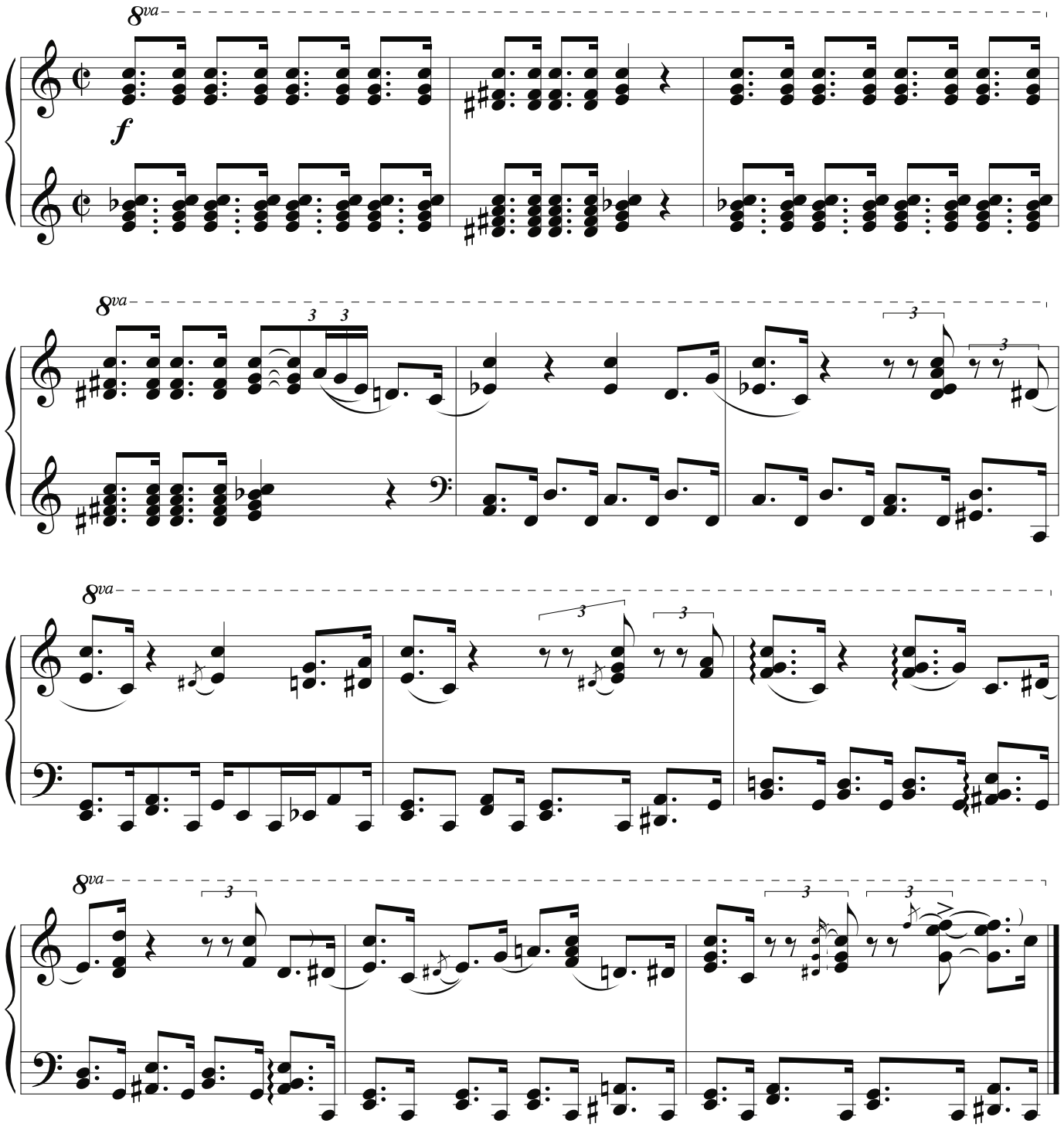
LAST MONTH, WE EXAMINED SOME OF THE BASIC BUILDING BLOCKS OF boogie-woogie piano. Now in Part 2 of my series, I continue by examining two further elements of this classic piano style: song intros and melodic development.

When You Can't Bend, Blend

"The problem with the piano is that you can't bend notes on it like you can on other instruments, explains **Axel Zwingenberger**. "Instead, you create that bluesy feeling by playing with the differences between major and minor sonorities." One of today's leading archaeologists of the boogie-woogie style, Axel now performs with the band the A, B, C, and D of Boogie Woogie, featuring Rolling Stones drummer Charlie Watts. Find out more at boogiewoogie.net.

1. Song Intros, Part 1

Ex. 1 is a common boogie-woogie piano intro. It sets the stage with both hands playing chords in a strong parallel rhythm. Like previous examples, this is in the key of *C* and uses the 12-bar blues scheme. The opening tonic chords (with added seventh extensions), alternate with diminished *C* chords to impart harmonic variety. To play these in a stylistically correct way, add a "jumping" feeling to them.

Ex. 1.

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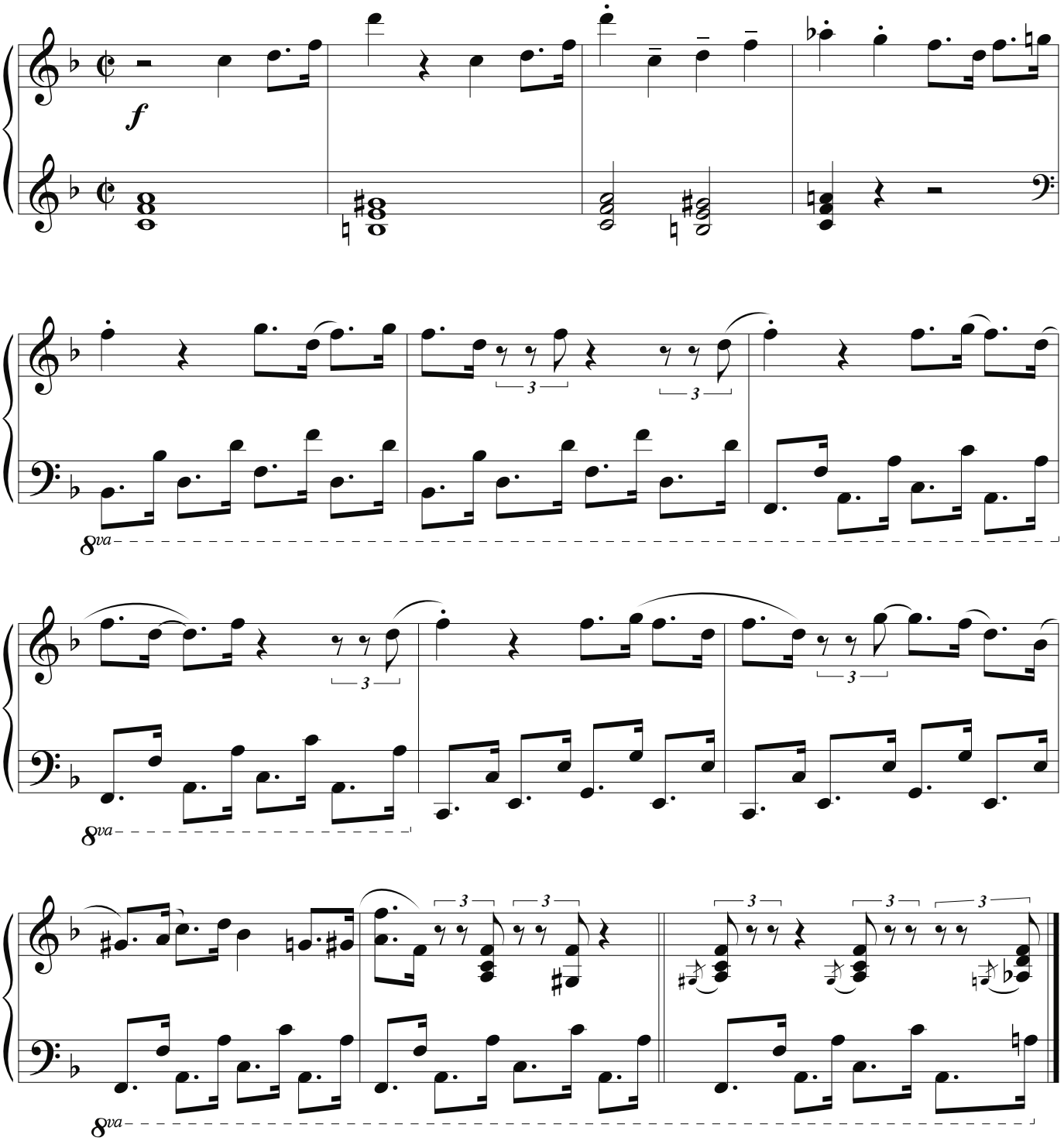
Watch the author perform vintage boogie-woogie live and hear his audio examples for this lesson.
keyboardmag.com/january2013

2. Song Intros, Part 2

Ex. 2 is another type of boogie intro, this time in *F*. In contrast to Ex. 1, the opening chorus largely forsakes big chords and clusters for a more transparent sound. Instead of heavy opening chords for the first four bars, the right hand plays a short melodic motif, accompanied by whole-note chords in the left. The bass line is played in octaves as a "walking bass," and is based on the three basic chord tones. This type of bass line is harmonically simple, but it creates rhythmic momentum as it moves up and down within each bar.

Ex. 2.

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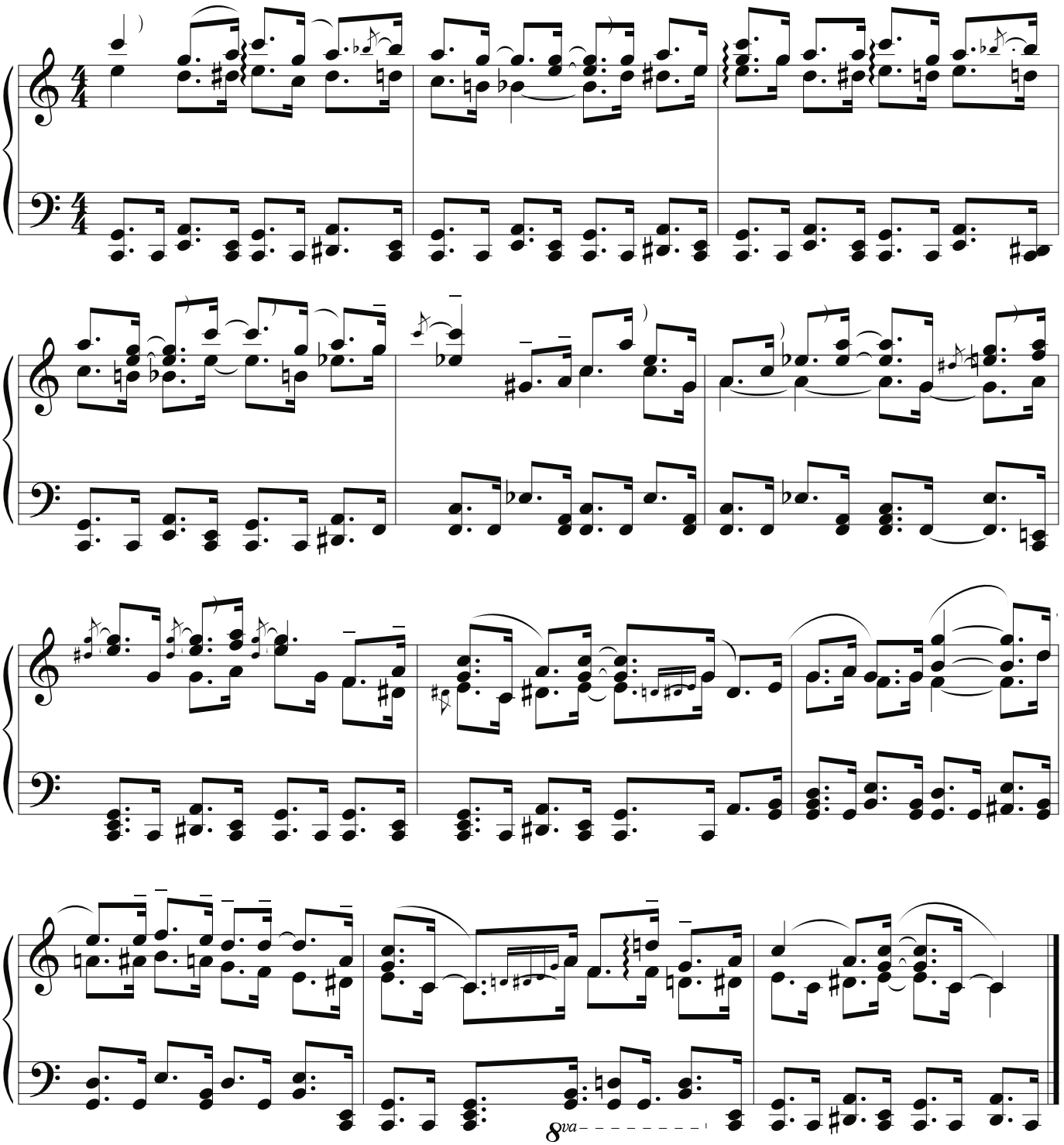
3. Melodic Development

Ex. 3 is a boogie-woogie piano chorus in *C*, this time played at a medium pace. The entire chorus consists of a right-hand melodic line in two voices, which creates an inherently bluesy sound. This line is paired with a chorded bass part that further emphasizes the bluesy atmosphere. This example shows that it's essential to have a feeling for melody as well as rhythm and harmony to play boogie-woogie properly. Also note that in bars 6, 7, 8, and 11, the small grace notes are played by sliding your index finger from a black key to a white one. This lets you play them quickly without complicated fingerings.

Ex. 3.

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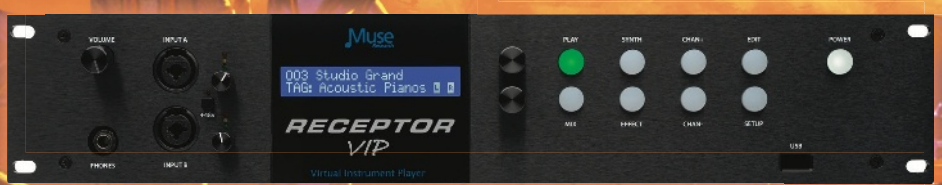

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THE VIRTUAL ORCHESTRA

Strings Basics

BY ROB SHROCK

MANY FILM AND TV SCORES LIVE OR DIE ON HOW WELL THE STRINGS ARE conjured. Fortunately, the state of the art of sampled string libraries is finally approaching a level of illusion that can convince all but the most refined ears. As much as we'd all love to play a keyboard and sound like a symphony orchestra, it almost always takes the patient construction of multiple tracks and an understanding of real orchestration to create authentic string passages.

The interweaving of independent lines, subleties of articulations, and wide range of notes in typical string writing make good DAW sequencing and editing skills an asset. All string libraries, each in their unique way, require a certain amount of struggle and concession to tame the beast. Unlike winds, strings can play for a long time without a break and can be counted on equally for melody, harmony, and rhythmic propulsion. In many ways, the whole string section can be thought of as one big instrument; however, navigating the nuances of the various sections and their respective ranges is the hallmark of good orchestration.

Sections

The typical string orchestra is composed of two violin sections (I and II), violas, cellos, and basses. To maintain balance, it's generally necessary to add more players to each section as the instruments get physically smaller. A full symphonic string orchestra would contain something like 12 violins I; ten violins II; eight violas; four cellos; and two basses. In reality, the sizes of sections vary widely based on period, style, the composer's intent, and budget. Several of the top string libraries provide unique sample sets for Violins I and II (as they should), including *Cinematic Strings*, Kirk Hunter Studios *Concert Strings 2*, EastWest *Hollywood Strings*, Audiobro *L.A. Scoring Strings*, and Sonivox *Symphonic Strings Collection*.

When a section needs to cover more than one musical line at a time, it's further divided into halves (or even thirds), known as *divisi* (see Figure 1). In a real orchestra, there are a fixed number of players, and as they split into *divisi* the timbre gets lighter because fewer players are on each note.

Layering ensemble sample patches is common and can be very effective for both creating timbre complexity and to mask any deficiencies in a certain patch. However, be careful of the unnatural size buildup that can result. For instance, layering three large ensemble violin patches made of 12 players each would result in 36 "players" per note, creating an obvious "you used samples" sound.

Hollywood Strings and *LASS* provide unique *divisi* patches for each section. Several other libraries provide some smaller sections and solo instruments for emulating chamber groups and *divisi*, including 8Dio *Adagio Violins*, *Concert Strings 2*, and the Vienna Symphonic Library. Another effective technique is to layer several patches of smaller sections for a part and record each patch as a separate performance.

In addition to using patches of smaller sections when layering, adding one or two solo instruments on top of an ensemble can enhance the illusion. Instruments found in *Vienna Instruments*, *Adagio Violins*, and *Concert Strings 2*, Garritan *Stradivari Solo Violin*, and Dan Dean *Solo Strings* are excellent for this.

Fig. 1. A Kontakt Multi of muted violas auto-divides chords between three *divisi* patches in *L.A. Scoring Strings*.

Articulations

Like other virtual orchestra instruments, string articulations are accessed with dedicated patches, keyswitches, and MIDI controls; each library applies these differently. In general, string articulations fall into two categories: long bows and short notes. All of the libraries mentioned here offer arco, marcato, spiccato, staccato, tremolo, pizzicato, and trill articulations (see Figure 2). *Adagio Violins*, *Hollywood Strings*, and *Vienna Instruments* explore several of the less common (but very musical) techniques like *détaché*, *flautando*, *loure*, and *col legno*.

Muted strings, or *sordino*, are a big part of orchestral writing. The softer, lighter texture is often used for sweet or poignant musical statements, and a recent scoring technique is to add a *sordino* string pass on top of a normal pass for a hybrid sound. *Adagio Violins*, *Symphonic String Collection*, *LASS*, and *Vienna Instruments* provide sampled *sordino* instruments. *LASS Legato Sordino* is a separate library completely dedicated to muted strings, and it sounds gorgeous.

Fig. 2. 8Dio *Adagio Violins* contains a number of key-switched articulations. Loure, a type of bowed repetition, isn't found in most other libraries, and can be tempo-synced.

Fig. 3. *Hollywood Strings* features five mic positions and convolution reverb from Quantum Leap Spaces.

Legato mode (not the legato articulation), previously covered with brass and woodwinds, is monophonic and usually employs small transition samples between overlapping notes for greater authenticity within a musical line. Strings benefit tremendously from this, as it's practically impossible otherwise to recreate the expressive glissando and portamento that happens when strings subtlely slide between notes.

Adagio Violins, *Cinematic Strings*, *Concert Strings 2*, *Hollywood Strings*, both *LASS* and *LASS LS*, and *Vienna Instruments* include legato patches. To a large degree, each library allows you to tweak and control the note transitions. As with all orchestral instruments, you'll need to roll up your sleeves and do some editing after you record. However, when you spend the time musically crafting lines for each patch of your string section, you'll hear the difference. The cumulative results just can't be achieved any other way.

Virtual Space

Adagio Violins, *Cinematic Strings*, *Hollywood Strings*, and *LASS* were recorded in legendary rooms and provide multiple mic perspectives, usually a combination of close and room sounds that can be balanced by the user (see Figure 3). Although harder on CPU resources when all "mics" are running simultaneously, they really only need to be rendered for your final output. The ability to tailor the character of these libraries provides for a fantastic level of tonal flexibility.

No matter how ambient or dry the various libraries may be, some unifying reverb is usually necessary to further smooth out the sample transitions and tie everything together, especially when layering different string libraries and/or blending them with brass and woodwinds.

There are obviously many reverb choices available today; however, two standouts need to be mentioned. Lexicon's "Random Hall" (now found in their PCM Native Reverb plug-in) has long been a staple of countless orchestral scores.

Quantum Leap's Spaces is a simple and extremely effective convolution reverb plug-in, which features a number of great-sounding rooms and halls catering to orchestral music. Spaces goes a step further with instrument-specific presets that place your samples in the proper position on the soundstage. ♫

SOUNDCLOUD

Hear audio examples of realistic virtual strings.
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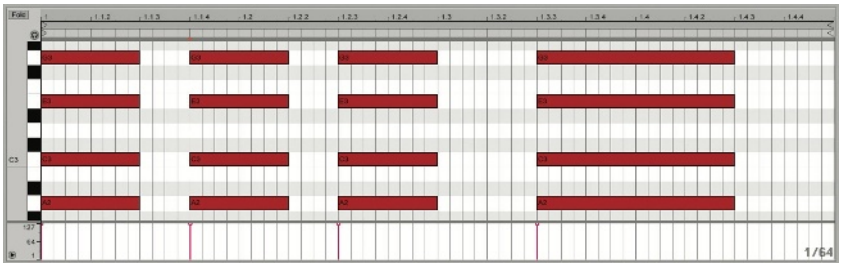
Divide and Conquer

BY FRANCIS PRÈVE

WOLFGANG GARTNER'S 2012 HIT "THERE AND BACK" PIVOTS ON HUMONGOUS CHORD STABS THAT, UPON CLOSER inspection, consist of embedded arpeggios and melodies, each with a different synth patch. This is a variation on a classical music technique called *hocketing*, which divides a melodic motif over multiple instruments, each of which plays a different section of a larger tune.

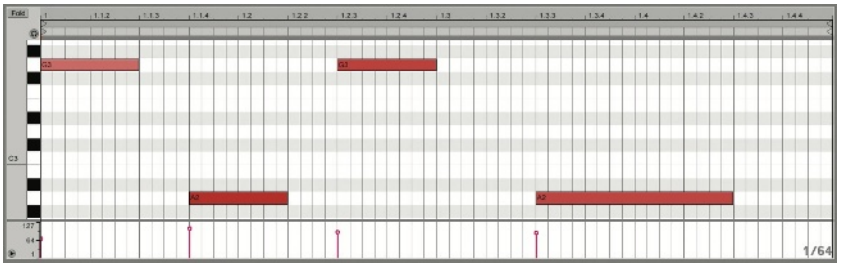


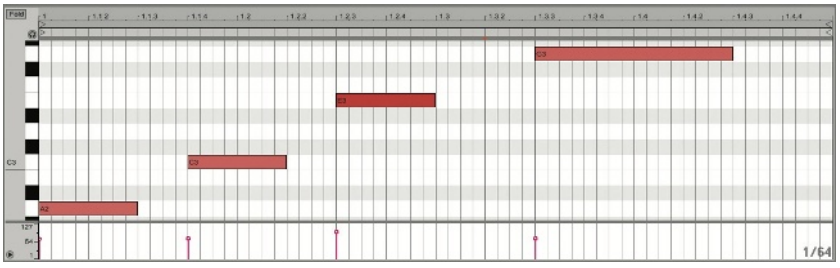
Step 1

Start by making a classic chord progression that relies on big stabs using a super saw patch or something similar. This will serve as the basis for the other elements. For this example, I created a simple repeating seventh chord.

Step 2

Copy that sequence to another track and eliminate all but one note from each chord, like so. Then design your own unique, aggressive patch—or select a preset that does the trick. Here, I simply created an alternating pattern between the uppermost and lowest notes from the chord.



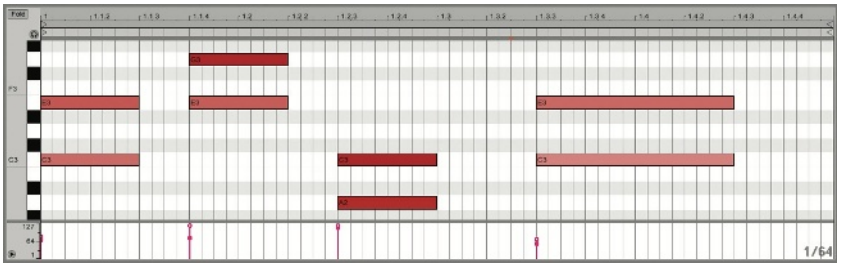


Step 3

Copy the chord sequence again, this time creating a melody or arpeggio that doesn't play any of the notes from the previous sequence simultaneously. That is, no note from the previous sequence should sound at the same time in *this* sequence. For this example, I created a simple upward arpeggio that used a big square wave patch.

Step 4

Create a third sequence, based on simple two-note intervals comprised of the remaining notes of the chord that haven't yet been used. Again, use a different patch for this sound. Here, I used thirds.



Step 5

Once you've created the individual sequences and double-checked to make sure there are no redundant notes, play all three sequences simultaneously. Then tweak the sounds and blend the parts according to taste. If everything's right, you should hear your original progression, but with a lot more complexity, with little melodies and arpeggios popping in and out. Now isn't that *way* more interesting than just copying everyone else's chord stabs? ♫

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THE ART OF SYNTH SOLOING

Mono Legato Licks and Riffs

BY JERRY KOVARSKY

LAST MONTH, WE DISTINGUISHED BETWEEN TWO BEHAVIORS A SYNTHESIZER might have for triggering volume or filter envelopes. There's single triggering, in which the envelope begins when you first hit a note but doesn't re-trigger unless you hit another note *after* removing all fingers from the keyboard; in more musical terms, legato notes won't re-trigger the envelope. Multiple triggering, by contrast, *does* re-trigger the envelope with every key press, legato or not. Single triggering is also called "mono legato" mode, and this month, we'll explore riffs that work well with it.

Trills

A trill is simply a rapid alternation between two pitches. Practicing trills using different groupings of fingers is a time-honored way of developing your finger strength and independence. But have you tried to do this with a mono legato synth sound, and get each note to clearly articulate? This is difficult—try it and see! Purists who think that technique should only be practiced on the acoustic piano should take note: Sometimes technology can be your friend and point out aspects of your playing that are hard to notice or even hidden on the acoustic piano. I remember reading an interview with the late, great Oscar Peterson where he used an obvious velocity split transition as a way of judging his touch; by varying the split point value he could test himself to accurately stay below the level in a controlled fashion. But I digress.

For this column I want to embrace envelopes that don't re-trigger when you play legato. The technique is holding a sustained note and then trilling to and from another tone. Set your synth to a Mono Legato setting with Last Note Priority selected, then try **Ex. 1**, bars 1 and 2, to get started.

You hold the *E* with your thumb and play the *G* above it with your index finger. When you let go of the *G*, the *E* will re-sound without you having to trigger it—this is mono legato at work, and will sound like you played the example in bars 3 and 4. Often, you'll need to raise the filter cutoff or the sustain segment of the filter envelope to allow your notes to be heard clearly, as discussed last month. I've notated these for easy reading, but be sure to double or even triple the timing resolution to play these properly.

From this simple beginning you can work on alternating between different notes: In **Ex. 2** I'm (mostly) using the *E* minor pentatonic scale.

Next up, try trilling using a sustained note and lower tones as in **Ex. 3**.

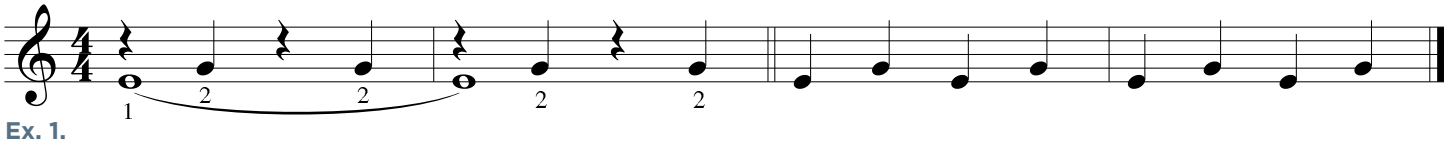
As you get comfortable with this technique you should start to incorporate slow pitch-bend rises and falls, and the various filter sweep techniques we've discussed in previous columns.

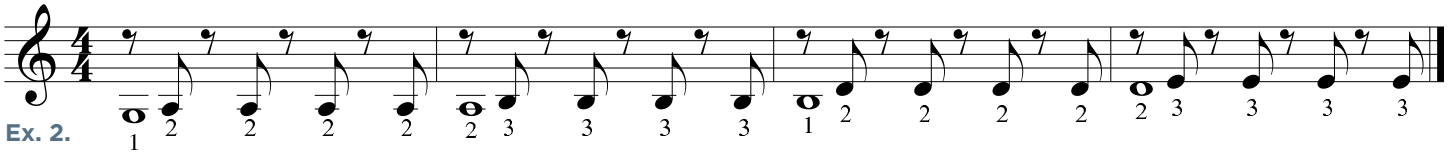
Getting Hammered

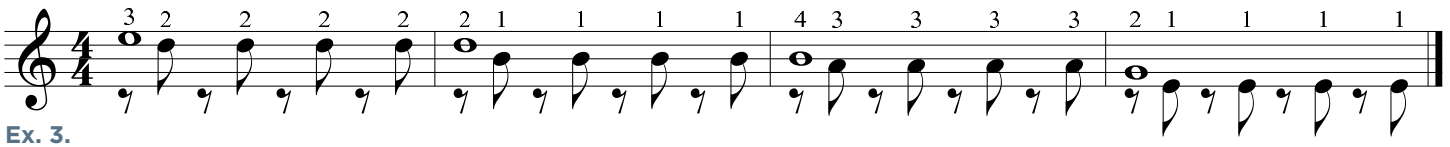
Moving onward, try sustaining a note and varying the notes that you use to trill. This moves us into a simulation of what guitarists call "hammer-ons," which are done by alternating between an open string and other notes tapped with a finger, or pulled with the fingertip, with no extra picking involved. You can see the similarity with our mono legato technique, with the picking representing the re-triggering of the string/envelope. **Ex. 4a**, **4b**, and **4c** (page 42) are a few simple riffs to get you started.

Pay close attention to the timing of your note releases. Holding the key for a full eighth-note gives an even feel, where as sometimes letting go closer to a sixteenth-note worth of duration can impart a feeling that the sustained note is being accented or rushed slightly.

There are plenty of examples and videos on the Internet of guitarists playing hammer-ons. Keyboardists like Jordan Rudess (Dream Theater), Derek Sherinian (Planet X, Black Country Communion), Janne Warman (Children of Bodom), Jens Johansson (Stratovarius, Yngwie Malmsteen), and


Ex. 1.


Ex. 2.


Ex. 3.

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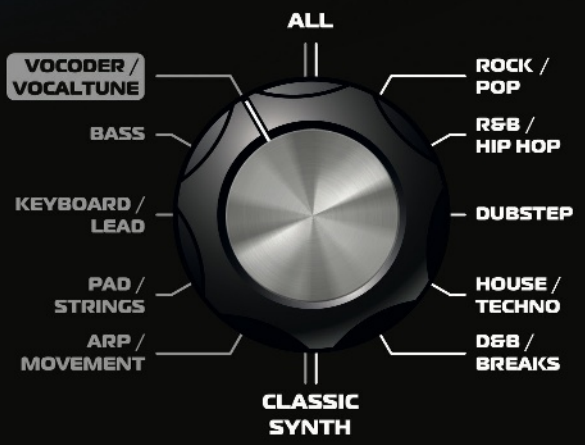

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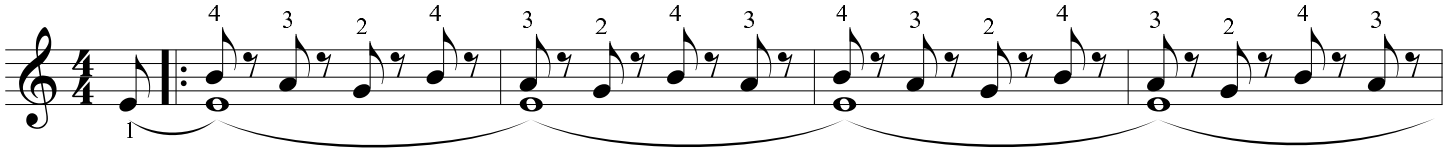
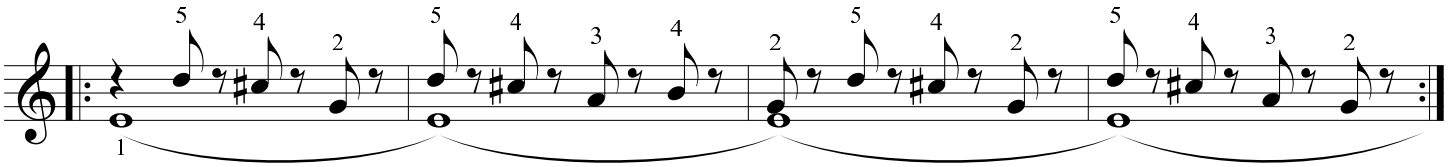
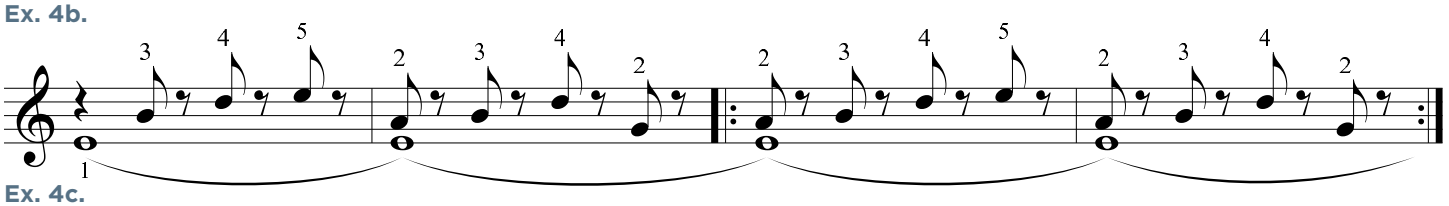


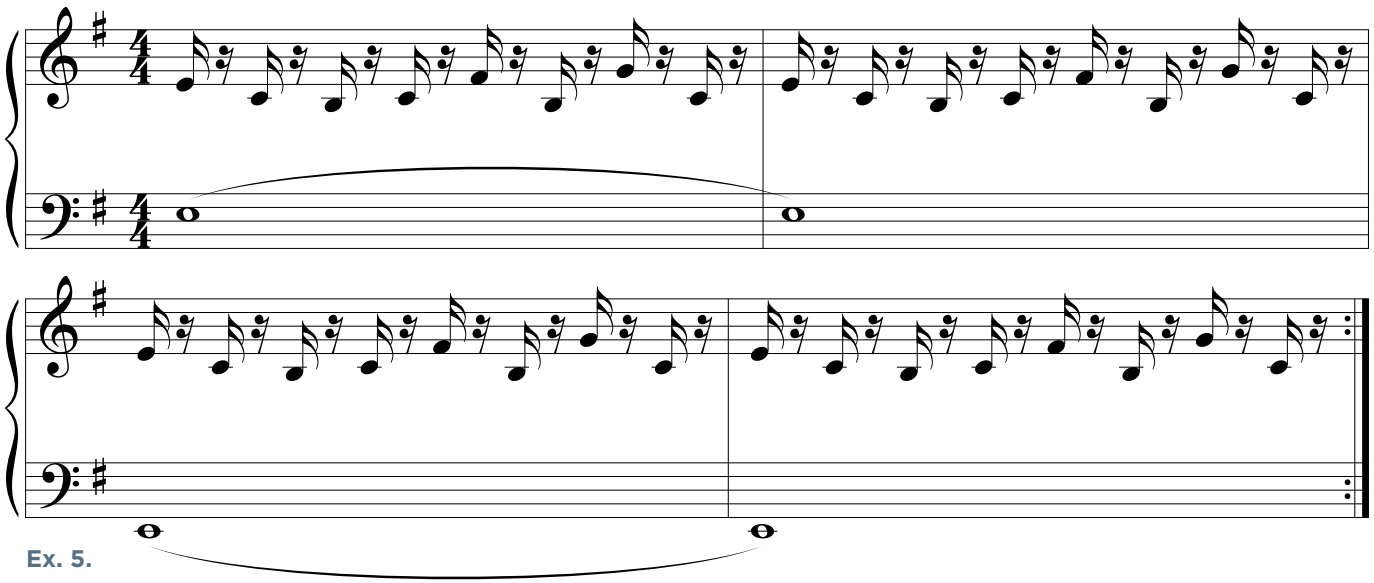
Ex. 4a.



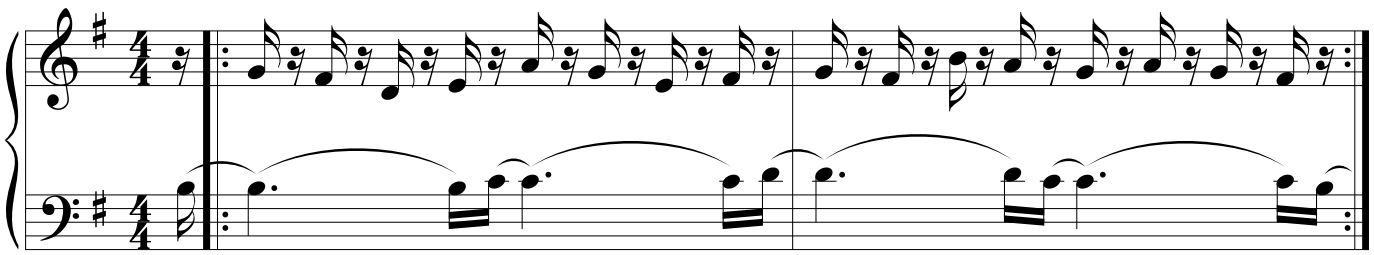
Ex. 4b.



Ex. 4c.



Ex. 5.



Ex. 6.

Michael Pinella (Symphony X) all have embraced and mastered these techniques.

Go Low

Another way to incorporate this technique into your playing is to use two hands, and sustain a note an octave or more below the right-hand groupings you're moving around. You'll need to play the right-hand notes more detached to let the low note clearly "speak" in the spaces, as in **Ex. 5**.

Another cool variant is to move around the sustaining left-hand notes. This requires a very legato touch and you must slightly anticipate each new left-hand note to make it sound smooth, without re-triggering the envelopes or playing the left- and right-hand notes at the same time. Try this simple riff in **Ex. 6** to get you started.

So, that's plenty to digest and practice this month. Be sure to try these riffs in all 12 keys and at different tempos—and start developing your own licks based on these concepts. Happy soloing! ♫

SOUNDCLOUD

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MIDI Controllers
FOR MOBILE MUSIC

BY DAVID BATTINO

A PORTABLE KEYBOARD CONTROLLER MAKES A WONDERFUL COMPANION. The choices have multiplied since my mini-keys roundup back in December 2011, and the technology has become even friendlier to mobile musicians whose on-the-go platform is an Apple iOS device, a laptop computer, or both.

This time, I played three full-sized 49-key controllers plus two new mini-keys models. Some of these draw so little juice you can power them from an iPhone, and two include cables for direct connection to the iOS 30-pin dock connector. While most look Spartan at first glance, each offers unique and surprising features.

CoreMIDI Connection

All keyboards in this roundup can play soft synths on an Apple iOS device, so long as your apps support the CoreMIDI standard. The IK iRig Keys and Line 6 Mobile Keys even have a cable for direct iOS connection. You'll need a Lightning to 30-pin adapter (shown) for the fourth-gen iPad, iPad Mini, iPhone 5, and latest iPod touch. Note that iPhones older than the 3GS and iPod Touches older than the third generation don't support CoreMIDI.

With the other three keyboards, you'll use a USB cable plus Apple's Camera Connector Kit ($29) for iPad generations 1–3 and iPhones through the 4S, or the Lightning to USB Camera Adapter (also $29) for the fourth-gen iPad, iPad Mini, and iPhone 5. The Samson Graphite draws more power than an iPhone or iPad can provide, so you'll need an AC adapter or a powered USB hub.

Read our review of the Alesis QX49, which arrived a bit too late to make this roundup.
keyboardmag.com/january2013

	Line 6 Mobile Keys 49	Samson Carbon 49	Samson Graphite 49	M-Audio Axiom AIR Mini 32	IK Multimedia iRig Keys
Price (list | street)	$199.95 | $149.95	$124.99 | $89.99	$299.99 | $199.99	$129.95 | $99.99	$99.99 | $99.99
Performance controls	2 knobs	1 slider, 1 knob	8 knobs, 9 sliders, 4 pads (x 2 banks)	8 knobs, 8 pads (x 2 banks), pitch and mod buttons	1 knob
Buttons	Octave shift/ transpose	Transpose +/– (assignable to program or channel)	Transpose +/– (assignable to program or channel); 16 assignable; 5 transport	Cursor diamond (for HyperControl); 3 DAW transport	Program +/–
Connectivity	USB, sustain, expression, dedicated iOS	USB, sustain, MIDI out	USB, sustain, MIDI out, DC in	Mini-USB	Micro-USB, switchable sustain/expression, dedicated iOS
Included software	None	Native Instruments Komplete Elements 8 (Mac/Win)	Native Instruments Komplete Elements 8 (Mac/Win)	Ableton Live Lite; AIR Ignite (Mac/Win)	Free sounds for SampleTank and iGrandPiano iOS; SampleTank 2L (Mac/Win)
What's programmable?	Knobs, mod wheel, expression pedal	Knob, fader, mod wheel	Knobs, faders, buttons, splits	Knobs, buttons	Knob (5 banks)
Velocity curves	9 + 1 fixed	3 + 1 fixed	7 + 3 fixed	3 + drum + 1 fixed	3 + 3 fixed
Pros	Dedicated iOS cable. Expression pedal jack.	Excellent value. iPad slot. MIDI out works simultaneously with USB.	Excellent value. Quality keys and pads with aftertouch. Controls galore.	Compact and slim. Good pads. DAW control buttons.	Compact. 4 scenes. Unusually balanced and good feeling mini-keys. Dedicated iOS cable.
Cons	Expensive for features offered. No MIDI jack or display.	Velocity curves need tweaking.	Pad bank selector is far from pads. Not iPad-powered.	No sustain jack. No MIDI jack. Pads share global MIDI channel.	No MIDI jack. Casing feels flimsy.
Website	line6.com	samsontech.com	samsontech.com	m-audio.com	ikmultimedia.com

LINE 6 MOBILE KEYS 49

The Mobile Keys 49 (and Mobile Keys 25) were the first MIDI controllers with a dedicated iOS port and cable. Plug right into an iPad or CoreMIDI-compatible iPhone or iPod Touch, and you can play soft synth apps while powering the keyboard.

The Mobile Keys' appetite for electricity is astonishingly low. After a three-hour rehearsal with my band, I noticed the battery meter on my first-gen iPad was still above 75 percent. Line 6 says the keyboard will run up to nine hours on iPad power.

In other ways, though, the Mobile Keys line is showing its age. Apple changed the connector on the latest iPads and iPods, so you'll need a Lightning-to-30-pin adapter ($29) to use the cable with these. At $149 street, the Mobile Keys 49 is almost twice as expensive as the Samson Carbon 49, which includes music software and more features.

Features and Controls

The Mobile Keys 49 is unique in this roundup in offering both sustain and expression pedal jacks. You can assign the expression pedal to any MIDI continuous controller. The mod wheel and two solid knobs are also programmable, and you can set the octave-shift buttons to transpose, or change the program or MIDI channel. Although there's no display, I found programming fast. You hold the Shift button while entering data, then release it to save your updates or send program changes. Pressing the unmarked top *C* saves your assignments after power-down.

Keyboard Feel

The unweighted (though full-sized) keys have a springy, plastic feel, but the nine velocity curves enable expressive dynamics. I especially liked the keyboard's compact size and weight.

SAMSON CARBON 49

At just $90 street, the pearly white Carbon is an amazing value. You get semi-weighted keys, three programmable controllers, and a handy slot that holds your iPad. Like the Line 6 Mobile Keys, the Carbon runs for hours on iPad power. Unlike the Mobile Keys, it comes with virtual instrument software: Native Instruments Komplete Elements, which includes basic but capable versions of Reaktor, Kontakt, and Guitar Rig. Also, there's no direct-to-dock cable like on the Mobile Keys, but using Apple's camera connection kit proved to be trouble-free. The Carbon is also available with 61 keys.

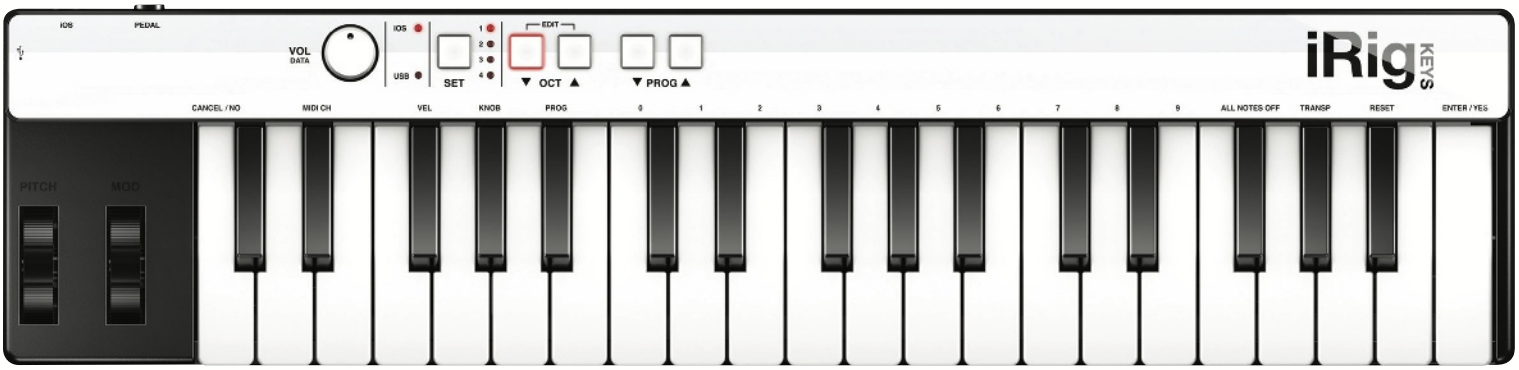
Features and Controls

In addition to standard CCs, you can send MIDI bank change commands and "all notes off." Programmable controllers include a rotary encoder, a fader, the mod wheel, and the sustain pedal jack. Two buttons conveniently placed above the wheels can change MIDI program, transposition, or channel, leaving the octave-shift buttons free for performance. A three-digit LED makes it clear what you're adjusting.

I was pleasantly surprised to find a five-pin MIDI Out jack, and happier when I discovered that the jack mirrored the USB MIDI output. That lets you play both hardware and software synths at once.

Keyboard Feel

The Carbon's semi-weighted keys have a pleasing snap, although they're a bit noisy when they bounce back. The three velocity curves didn't give me the control I got on the Mobile Keys. Soft notes often disappeared, creating a mushy feeling. On many soft synths, you can adjust the velocity response, so that may not be a problem.



IK MULTIMEDIA iRIG KEYS

The iRig Keys strikes a good balance between size and expressivity. You get three octaves of keys plus pitch and mod wheels. It's easily programmable from the front panel. It runs on iPad power. And, like the Mobile Keys, it includes a direct-to-iOS-device cable. (Also a 30-pin dock, so you'll need an adapter with newer iDevices.) Registering gets you SampleTank 2L (for Mac or Windows) and free sounds for two iOS apps: SampleTank and iGrand Piano.

Features and Controls

I was happy to find a sustain pedal jack on the iRig Keys, and intrigued that it doubles as an expression pedal jack. To select the pedal type, you plug it in and then turn on the power. The expression pedal always sends CC 11. The mod wheel isn't programmable either, but the knob is.

Here's the cool part, though: You can save four sets of parameter assignments and switch among them instantly with the Set button. In set 1, I programmed the knob to send CC 10 (pan) on channel 1. In set 2, I made it send CC 91 (reverb level) on channel 2, and so on. You can save transposition offsets and velocity curves as well. Press the Set button again, and you get the fifth (default) set.

Keyboard Feel

The iRig's mini-keys are surprisingly playable. Black keys have similar resistance to the white ones. (On other mini-keys I've played, stiff black keys make it hard to play evenly.) There are three velocity curves and three fixed velocities; the curves were pretty musical. The pitch wheel is slippery, but it's so close to the edge you can play it easily with your thumb. Construction is on the light side; my review unit was bowed in the middle and flexed when I twisted the ends.

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M-AUDIO AXIOM AIR MINI 32

Little keyboard, big name: The Axiom AIR Mini 32 packs two and a half octaves of mini-keys and a mass of MIDI controllers into a case just 1.4 inches high. (Versions with 25, 49, and 61 full-sized keys are on the way.) It's slim, yet solid. The trapezoidal body barely flexed when I twisted it, and it slipped nicely into a backpack next to my MacBook Air.

The AIR in this keyboard comes from AIR Music Technology—formerly Avid's Advanced Instrument Research group. Here, the payoff is the companion creativity software called Ignite. Ignite wasn't available at press time, but will be coming as a free download. The AIR Mini did come with a download link for Ableton Live Lite.

Features and Controls

Instead of wheels, the AIR Mini offers three closely spaced buttons, each the size of a pencil eraser. The outer two bend the pitch up and down. The center one controls modulation. It's a clever design: As you hold the button, the value ramps up at a rate you can preset, from instantaneous (127) to two seconds (0). I found a rate of 50 was a good compromise, but I missed the control of true wheels. Pressure-sensitive pads might have worked better.

The AIR Mini also lacks a sustain pedal jack. Instead it offers a sustain button, which you can set to momentary or toggle mode. It crossed my mind to crack open the case and solder a jack across the terminals.

Eight slippery knobs are preset to CCs 1–8. When the keyboard is connected to a compatible program, the adjacent HyperControl button toggles the knobs among three additional modes: Volume, Pan, and Instrument/FX. HyperControl is supposed to provide instant control mapping for DAWs, and is currently in development for Cubase, Logic, Pro Tools, Reason, and Ableton Live, with release date announcements expected at the 2013 Winter NAMM show.

I really liked the transport controls; pressing Play and Stop buttons felt much more musical than whacking my computer's spacebar. I had to map the buttons manually, but that was easy. A cursor diamond to the left is designed for mouse-free navigation, and will likely be indispensable when Ignite comes out. In the meantime, it sends five more CCs.

The drum pads have a comfortable, soft texture and good response. They share the velocity curve with the keyboard. Unfortunately, they share the MIDI channel as well. That means you can't trigger drums on the pads while playing bass lines on the keyboard unless you set up a split on the destination synth. More misses: The pads don't transmit aftertouch, nor can they be set to toggle mode so you can lock in a loop. M-Audio tells us they're looking into adding this feature in a firmware update.

Programming

On the plus side, the AIR Mini is quite customizable. You can set CCs for almost all the buttons, and even set the minimum and maximum values for the knobs. What's more, you can do it all from the front panel. Although they're not labeled, 31 of the keys have other functions in Edit mode. You can save ten sets of assignments.

Keyboard Feel

Like the Keystation Mini 32 in my mini-key controller roundup (Dec. '11), the AIR Mini gains its svelte shape by using low-profile keys. They travel only about a quarter of an inch, with the black keys rising just 3/16" past the white keys. I found that similar height disorienting, but the keyboard is fast and quiet, and the velocity curves paired well with sensitive instruments like Modartt Pianoteq 4.

IGNITED STATES

M-Audio designed its Axiom AIR controllers to integrate with Ignite, a new music creation program from AIR. Advanced Instrument Research (originally so named when Avid/Digidesign acquired soft synth developer Wizoo) is the German company behind a number of well-regarded Pro Tools effects and soft synths including Strike, Velvet, and Structure. But Ignite is a departure from the digital audio workstation concept.

In Ignite, you record into clips, which you can then arrange into songs. There are no rigid tracks. A tabbed interface divides the creative process into different activities to help you focus. Due in January 2013, Ignite is slated to come with 275 instrument sounds, plus phrase generators to fire up your creativity. M-Audio says the controls on its Axiom AIR keyboards will map automatically to parameters in Ignite. For more information, visit airmusictech.com.

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SAMSON GRAPHITE 49

Whereas Samson's Carbon sets a bang-for-the-buck benchmark for basic keyboard controllers, the Graphite delivers amazing value at the higher end. Keyboards comparable to this $199, four-octave controller cost more than twice as much. The Graphite also comes in a 25-key version.

You get nine programmable 30mm faders, eight rotary encoders, 16 buttons, and four velocity- and pressure-sensitive drum pads—each with two banks. In addition, there are transport controls and the star of the show: a semi-weighted keyboard with aftertouch. Like the Carbon, the Graphite comes with Native Instruments Komplete Elements, a strong bonus. It also includes a five-pin MIDI out that you can address separately from the USB port.

Features and Controls

In contrast to the Carbon's smooth curves, the Graphite has pronounced sharp edges. It's also significantly heftier, thanks to the metal-backed keys. The wheels have a grooved rubber grip, and the knobs are rubberized, too. I found the buttons a tad wiggly, but the faders have a reassuring resistance. Overall, it's a quality feel. There's very little flex in the case.

The Graphite has four main modes: Performance, Setup, Zone, and Preset. In Performance mode, the faders typically control volume on MIDI channels 1–8 and 9–16, with the ninth fader handling master volume. Knobs control panning, and the buttons mute or solo channels in a DAW. Bank buttons shift the output of the knobs, faders, and buttons to the next (or previous) group of eight channels so you can quickly navigate a large software mixer. I do wish the display indicated the current base channel, though.

Programming

In Setup mode, you can program each knob, button, fader, and pad, although you can't set minimum and maximum values for them to send. The bright display makes it easy to see what's going on once you suss out the abbreviations. The bottom 17 keys double as shortcuts to common settings such as drawbar mode and velocity curve. There's a software editor, but frankly, I never felt the need to use it.

Zone mode lets you configure four key zones to create splits and layers. Over USB, the Graphite offers four virtual MIDI ports, along with a fifth for DAW control, so it's quite capable. You can even set a specific MIDI program number for each zone. Missing are velocity-based layers, which would let you switch sounds by playing harder.

Finally, Preset mode lets you store up to 30 setups. Nine correspond to popular software such as Sonar, Logic, Reason, and Live. Following a tip from Craig Anderton, I gained control of Live by setting it to Mackie Control mode on the Graphite's MIDI port 5. (Unfortunately, the manual is mute on configuring DAW software.) I especially appreciated the ninth fader, which the Graphite locked to Live's master volume even as I shifted the other faders to adjacent channels.

Keyboard Feel

The crisp, solid keys put the Graphite in a different class compared to other controllers in this roundup. The keys snap back noisily, but give a greater feeling of control. Both the keys and drum pads sense aftertouch, and the response is smooth. One downside: The pad bank button is at the opposite end of the keyboard, making it tough to switch sounds live. ♫

You can adjust all Graphite parameters from the keyboard itself, but the software editor puts them in context. Here we're setting the virtual MIDI port for drum pad 1.

MUSIC SYNTHESIZER

mx49/mx61

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CASIO
Privia PX-350

BY RICHARD LEITER

Keyboard K KEYBUY AWARD

THE ORIGINAL PRIVIA WAS THE ANSWER TO MANY PIANISTS' prayers: the first (and for some time the only) serious 88-key digital piano at the unprecedented price of 500 bucks and weight of 25 pounds. This made it a catalyst for increased competition in the under-a-grand piano market: 128-voice polyphony, graded and weighted keyboard actions, and ample supplemental sounds are pretty standard these days. What does Casio do to up the ante? For the latest Privia, the PX-350, they plunged their resources into a piano playing experience so improved it's astonishing.

Piano Sound and Feel

Compared to the previous flagship Privia (the PX-330, reviewed Oct. '09), Casio has tripled the sample size of the main piano sound. They've also adjusted the key sensors such that there's a lot more going on than what you may be used to from a digital stage piano. For one, the keys transmit high-resolution MIDI to the internal sound engine (as well as any external software that can interpret it), so instead of 127 possible velocity values, there are 16,256.

On a graded keyboard, the hammers are (or seem to be) heavier and slower in the lower range, just like on a real piano, and they get gradually lighter as you ascend. The PX-350 has this, and also something called Hammer Response, an algorithm that accounts for the time it takes for the heavier hammers to hit the strings at a given MIDI velocity. Also, the key surfaces have a prominent texture that gives your fingers grip, wicks away moisture, and makes it hard to go back to stage pianos that don't have it.

The PX-350 has sustain resonance, which simulates the sound of all the strings vibrating in sympathy with actually-played notes when the damper pedal is down. Check out presets like "Grand Piano Dolce," which dials in resonance like you would reverb or chorus. The effect is magical. Casio also touts AIR (Acoustic and Intelligent Resonator), their digital strategy for interpolating between the four velocity-switched sample levels. It works. You get smoother dynamics, finer control, and longer samples with barely noticeable loops. Slam down an octave near the bottom and it growls away for what seems like forever.

Bottom line: You have to engage the same level of mental and kinesthetic concentration that you would if playing an acoustic grand. Once you do, you have a *very* expressive instrument at your fingertips.

Other Sounds and Features

What Casio didn't do was tamper with the already robust feature array of the previous deluxe Privia, the PX-330. (We've reposted that review at keyboardmag.com/january2013.) For the $200 bump up from the PX-150 (which features the same piano sound), you get 250 sounds, a 17-track sequencer that records and plays MIDI files via driver-free USB2, a programmable drum machine with 180 rhythms, auto-accompaniment, and auto-harmony—the latter two with a bit of cheese factor but darned fun nonetheless.

There are cushy Rhodes simulations, a nasty little Wurly that's the go-to EP on anything funky, Clavs that cut, and a serviceable smattering of

Snap Judgment

PROS Uncanny grand piano playing experience. Audio recording of your performances. Graded action with textured keys. Giggable EPs, organs, basses, and General MIDI patches. Ultra-light.

CONS Audible compression effect at loud volume through internal speakers. Button layout is a bit congested.

organs. New in the PX-350 are a super-wide stereo string patch and some ballsy drum sounds. The bass/piano splits (with both acoustic and electric basses) work in many situations, and you'll be grateful for the pitch-bend wheel, which you can whip out at least once a night even on piano trio gigs.

One *new* feature I didn't expect—but that I'm now finding indispensible—is the audio recording. Plug in a USB flash drive, hit a couple of buttons, and you can now record anything that goes on in the instrument as a CD-quality (16-bit/44.1kHz) WAV file. This is great for capturing fleeting songwriting ideas, documenting practice for feedback from a teacher, or turning a solo gig into a demo.

On the Gig

I took the PX-350 out of the box and directly to a 150-seat jazz quartet gig. Going through a pair of Barbetta 41C keyboard amps, it took me a few songs to nail my sound. Most digital pianos, I now realize, are more forgiving than a well-miked acoustic grand. That's what this Privia—with its sensitive dynamics and wide separation—sounds and plays like in a live situation. For the first few tunes, I had to concentrate on my voicings and touch. Then, it began to sound like a good recording of a live performance. A week later I played a 500-seat corporate gig through a pro sound system with a stereo direct box and wedge monitor. Again, it felt like playing a miked acoustic, only now I knew how to take advantage of it. For example, you don't necessarily have to twist the volume dial to make it louder—you can simply dig in more.

The PX-350 sounds fine through its internal speakers until you crank the volume past about 75 percent (around three o'clock on the knob), at which point the complex samples begin to overdrive the output. To compensate, Casio inserted a limiter, but the only way to avoid an audible pumping sound is to keep the volume down. The signal from the Privia's line outs is hot enough that you can leave the keyboard volume knob below three o'clock and just raise the gain on your amp, P.A., or recording interface without adding to the noise floor. I tested this, and the results were loud and pure.

A final nit: On a dark stage, it's easy to reach for a sound category button and hit a Registration button instead. Registrations save the entire state of the instrument and can include rhythm and auto-accompaniment that starts right up. Pre-programming registrations (a good idea in any case) can save you an embarrassing moment here.

Conclusions

The Privia PX-350 has the soul of a real acoustic grand. It's inspiring and emotional in a way that I haven't experienced in a digital piano outside of the best virtual instruments and most expensive hardware digitals. Kudos and a Key Buy award to Casio for their commitment and execution. ♫

Bottom Line

The latest Privia delivers the most realistic piano experience you'll get for under a grand and rivals the sound and feel of stage pianos that cost many times more.

$1,099 list | $799 street
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SOUNDCLOUD

Read our review of the previous model, the PX-330, and hear original audio examples of the new PX-350.

keyboardmag.com/january2013

Refine your MOTU desktop studio experience

Run Digital Performer 8 and MachFive 3 on the new Apple iMac, control your audio with the elegant one-touch Track16, then add the latest advances in studio technology.

Apple iMac

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Novation Impulse

The professional USB/MIDI controller (25, 49 or 61 keys)

The Novation Impulse features a precision, semi-weighted keyboard, 8 drum pads and a full control surface. It comes with Novation's award-winning Automap (version 4), the original, most powerful, and now, easiest-to-use control software. This makes getting hands-on with Digital Performer and your plug-ins fast and simple.

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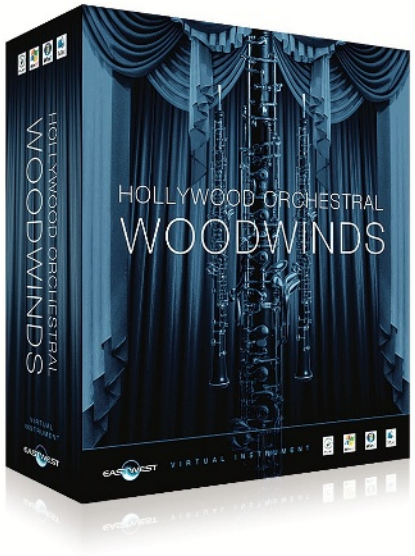

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NOVATION MiniNova

BY DAVID BATTINO

WHEN *KEYBOARD* REVIEWED THE NOVATION ULTRANOVA IN APRIL 2011, editor Stephen Fortner praised it for delivering "sound quality and programming depth to please the most hardcore synth snobs." His wish list for the next generation was short: more keys, more polyphony, and multitimbrality. Novation went the opposite direction with the new MiniNova, packing the UltraNova's sound engine into an even smaller case. They also added some slick performance features, and you'll find that the price is lower by about $200.

Snap Judgment

PROS Powerful synth engine. Impressive virtual analog and digital sounds. Thoughtful, grab-able performance controls. Good-sounding vocoder and VocalTune effect. Generous software bundle.

CONS No tap tempo button. No built-in battery power. No physical switch between mic and rear-panel inputs. Not multitimbral.

What It's Like, What It's Not

At first glance, the MiniNova resembles a MicroKorg XL, with its three-octave mini-keyboard, gooseneck mic, and large patch select knob. Both offer virtual analog synthesis and digital waveforms. Both are 22 inches wide, fitting inside carry-on luggage. They're even street-priced the same. Having reviewed both the MicroKorg and the UltraNova, I can speak to the differences.

The MiniNova has 18 voices of polyphony to the MicroKorg's eight; in vocoder mode, the Korg drops to four voices. Each MiniNova voice has three oscillators; the Korg has two (although it includes some longer samples and is two-part multitimbral). The MiniNova offers five simultaneous effects—three more than the Korg. It also sports a sustain pedal input, full-size pitch and mod wheels, a much deeper modulation matrix, and a more solid feel.

Unlike the MicroKorg, the MiniNova doesn't run on batteries. It also lacks the Korg's outstanding Natural Touch keys. The keys on the MiniNova are stiff, and the black keys have more resistance, so it can be hard to play precisely. That said, I found the keys fine for all but the fastest leads and bass lines. You get three velocity curves plus a drum mode (two velocity levels) and fixed velocity. If you want full-size keys with a crisp Fatar action and aftertouch, there's the UltraNova.

We found live tweaking very fluid and fun thanks to the gigantic rubberized filter knob and the four smaller knobs that do different things depending on where you set the vertical lever (far right). Below, the eight buttons can select favorite patches, trigger modulations, or toggle arpeggiator steps.

Other differences from the UltraNova include weight (5.5 versus 13 pounds) and connectivity. The UltraNova adds a two-in/four-out USB audio interface, MIDI thru, an expression pedal jack, S/PDIF out, and AutoMap controller capability. It also has an extra patch bank and many more knobs and buttons for editing.

Novation bills the UltraNova as more of a sound designer's synth, with all parameters easily accessible from the front panel. You can adjust almost every setting on the MiniNova too, but that requires lots of button-tapping. The upcoming editor software should help. A librarian program will load UltraNova patches into the MiniNova, as the internals of the two synths are identical. In fact, we go a lot deeper into the sound engine in the UltraNova review, which we've re-upped at keyboardmag.com/january2013.

As to included software, the MiniNova comes with download codes for Ableton Live Lite, Novation's Bass Station soft synth, and 1GB of Loopmasters samples. The well-written manual is a download as well.

Meet the Panel

Notice the two huge knobs. The left selects patch type and the right always controls filter cutoff. Having a giant grip for that all-important parameter is a treat. All the knobs on the MiniNova have a quality feel. You can set the five performance knobs to "pickup" mode, so they don't cause jumps in the sound.

You can tag each patch with a sound type and musical genre (for example, bass and dubstep). Stops along the left hemisphere of the selection knob are types; you get genres on the right. You then use the data encoder or patch buttons to choose patches in those categories. At 12 o'clock, the big knob lets you choose sounds from all categories. A switch sorts patches by name or number, which can speed up getting to the patch you want.

Category assignments are user-programmable, so you could assign all your lead sounds to alternate categories if the factory organization doesn't suit you. The beta version of the software librarian made this easy. You can also store your eight favorite patches under the light-up pads for quick access.

My favorite patches were the basses, leads, vocoders, and synth pads. Basses are particularly massive, and the leads benefit from the nasty filter distortion and wild LFOs.

Performance Controls

The four Performance knobs at right work with a six-position slider to access 24 sound parameters. The first seven parameters are assignable per patch. The eighth controls global effects level, a convenience lacking on the UltraNova.

One UltraNova innovation was its eight skin-sensitive knobs: Simply touching the knob could momentarily offset the value of a parameter. I used that to transpose Oscillator 2 for parallel harmonies and increase delay feedback to make a solo pop out. The MiniNova improves on that feature by adding eight multicolor "Animate" pads and a Hold button to lock in their values. You can lock multiple pads at once, and even assign multiple modulation destinations to each pad. For example, a single pad could boost filter resonance and distortion while adding the fifth above the root note.

Flip a lever, and the pads become on/off buttons for steps in the arpeggiator. Flip back to "Animate," and you can modulate the arpeggiated notes. Most of the deeper arpeggiator controls in the Edit menu stay live as well, such as gate time, octave span, swing, and length. That offers lots of performance variety. The big omission is a tap-tempo button, especially because the Tempo knob is not detented. I'd like to see a future OS update make the Favorite button double as a tap-tempo control.

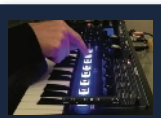
VocalTune

The other big new feature on the MiniNova is its VocalTune effect, which has three modes. Scale Correction mode lets you specify a scale and a key. The MiniNova then pitch-shifts audio from the mic or line input to the nearest note in the scale. That's ideal for hands-off correction.

Keyboard Control mode shifts the pitch to match the last note you played. Play a chord, and VocalTune shifts the incoming audio to the nearest note in the chord. This lets you play wacky melodies using external audio as the sound source. You can also bend the pitch and add vibrato with the pitch and mod wheels. It's great fun—and highly overused, but the MiniNova is deep enough that you're sure to find your own sound.

Finally, Pitch Shift mode transposes external audio. I created realtime harmonies by setting Oscillator 1 to use the incoming audio instead of its own waveforms, and then gating that audio with the keyboard. I then mapped the eight pads to change VocalTune's pitch-shift value so I could add different harmonies by pressing a pad. On my voice, the transposition sounded natural up to a fourth above the original note.

The included gooseneck mic is really good at rejecting off-axis sounds, so I never got feedback when playing with my band. However, the mic picks up thumps when you play the MiniNova's



Go deep into the identical sound engine in our UltraNova review, and see videos of the editor's first impressions and the author using the MiniNova's VocalTune.
keyboardmag.com/january2013

With up to 65dB of gain, the balanced mono input handles both guitar and line-level signals. Using it disables the XLR mic jack. You also get a sustain pedal jack, unusual on a mini-key synth.

keys or tap its pads, so you may want a cabled mic instead. Plugging in my AKG D3900 improved the sound significantly.

Of course, old-school vocoder patches abound, and the MiniNova was audibly better than the UltraNova at making my synth-ified words understandable. Novation confirmed that this is due to an improved vocoder algorithm, which will also be available for the UltraNova in a firmware update.

Conclusions

For the same price as the MicroKorg XL or XL+, the MiniNova gives you deeper synthesis, a third oscillator, more polyphony, more effects, more performance controllers, and triple the patch memory. The keyboard action is just adequate, and we'd still like to see at least two-part multitimbral capability, but the MiniNova offers so many other ways to get hands-on with your sound that it sets a new level of expressive potential for a compact, affordable synth. ♫

Bottom Line

The power of a full-scale virtual analog and wavetable synth packed into a mini-keys package.

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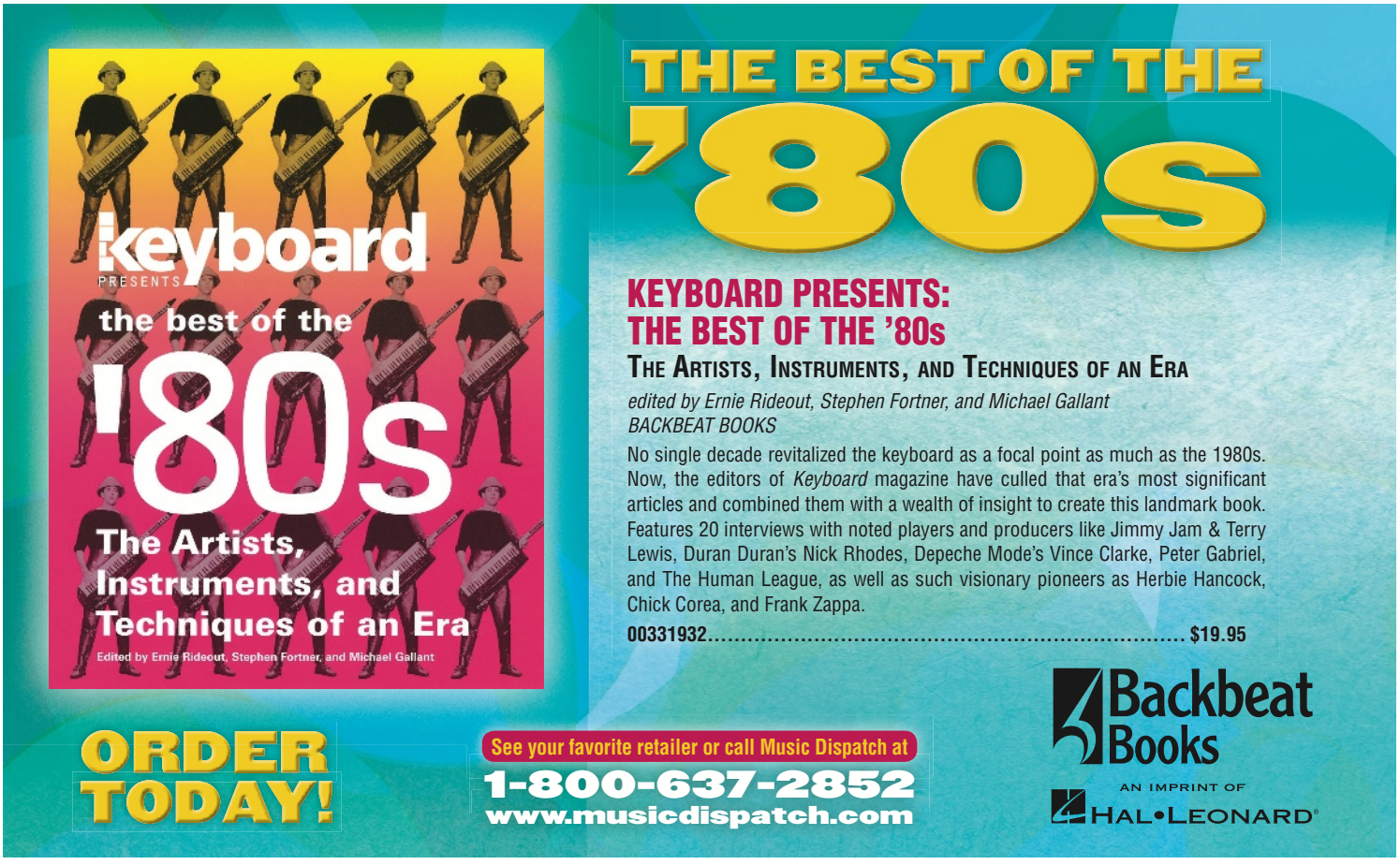

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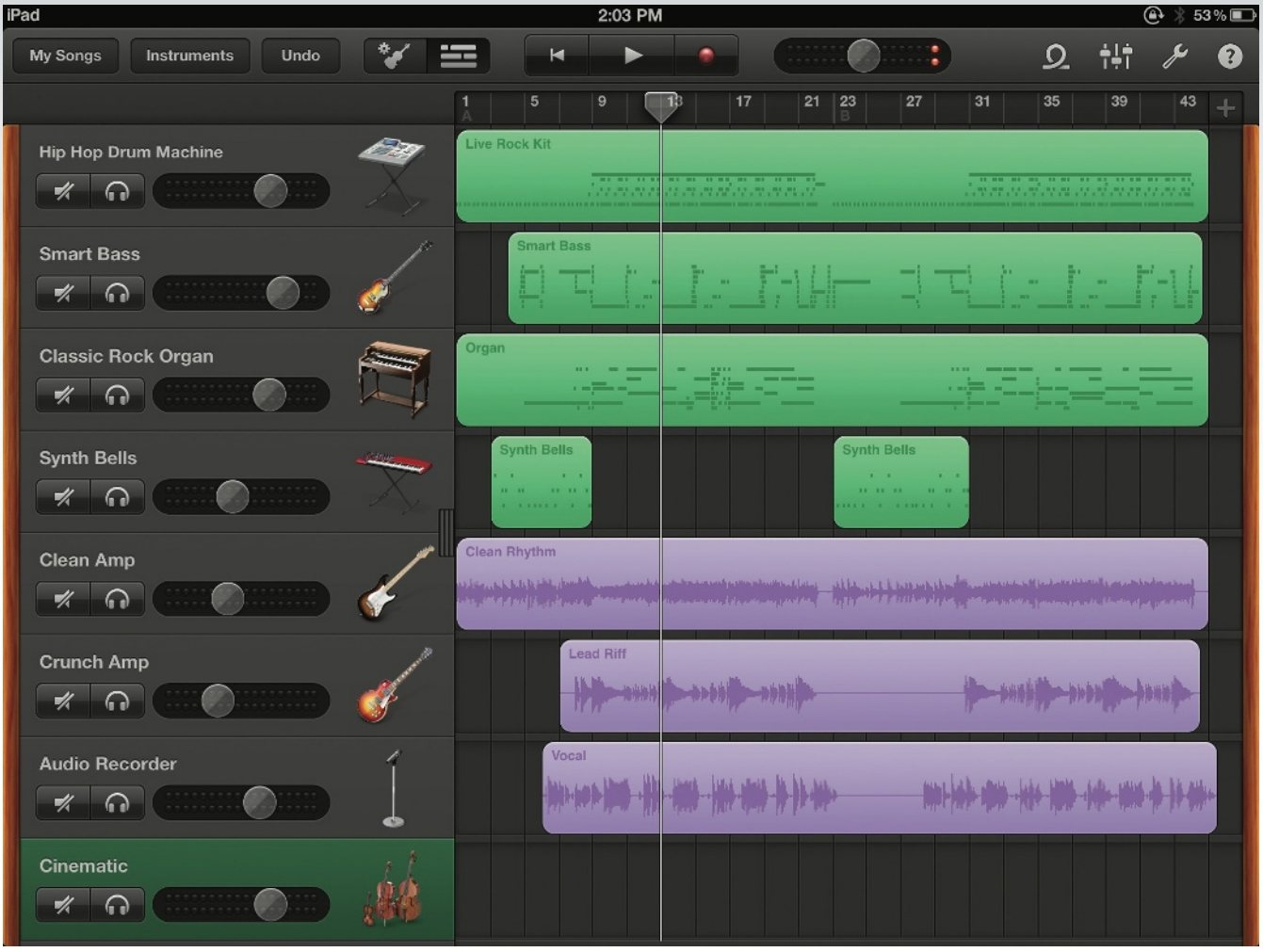

APPLE

GarageBand for iOS

BY STEPHEN FORTNER

GARAGEBAND HAS LONG BEEN *THE* GATEWAY TO MULTITRACK music production for beginners, the iOS version even more so thanks to the element of touch. However, I'd been hearing so much praise for it, mainly from colleagues who could hardly be called beginners, that I began to wonder how seriously one could take it as a professional musical sketchpad. Based on my testing on three iOS devices—an original iPad, a third-gen Retina iPad, and an iPhone 4—the short answer is: Very.

Playing Sounds

For the most part, GarageBand's instrument sounds aren't just "good for a mobile device," they're good, period. Some are crazy good, like the B-3 organs. There's full drawbar control, the percussion behaves properly, the C3 chorus (the only choice) is authentic, the distortion is warm and not buzzy, and the Leslie simulation is killer (see Figure 1). I'm a notorious stickler for B-3 and Leslie sound, and I'd have no problem with this as my sole clonewheel on a gig.

Rhodes and Wurly are just as well rendered, delivering gentle to barking timbres with aplomb. They have a lush chorus and panning tremolo, but no phaser on either—which you do get on the Clav, along with a funky auto-wah. Synths cover a spectrum of analog, FM, and wavetable textures, and are so well curated that whatever musical

Snap Judgment

PROS Strikingly good sounds. Healthy library of Apple Loops is expertly played throughout. Smart Instruments are surprisingly useful, even for trained musicians. Piano-roll editor offers a lot of per-note tweaking.

CONS Brass instruments and loops are oddly absent. Apple Loops can't follow chord changes within a song. Eight track limit—though you can bounce.

Fig. 1. The GarageBand organ. Yes, that Leslie horn spins. As on all keyboard sounds, sliding your finger sideways can either play a glissando, or drag the keyboard into a different range.

Fig. 2. Editable chords in the Smart Strings.

style you're going for, you'll find truly inspiring sounds. With an external keyboard, some of the synths even make use of aftertouch. The only sounds that underwhelmed me were the acoustic pianos, though they're perfectly serviceable for a demo.

On many sounds, the iOS device's accelerometer is used to impart velocity sensing. You'll want an external controller for serious playing, but I was surprised at how well velocity worked on the touchscreen.

One sound category is conspicuously absent: brass. I couldn't find a trumpet or trombone anywhere, let alone a tuba or French horn. Even the included Apple Loops (drag-and-drop audio files) had a number of cool sax and flute offerings, but were bereft of any brass riffs that you'd want for funk or R&B. On the plus side, the rhythm guitar loops were funky, expertly played standouts in a very Nile Rodgers style.

Smart Instruments

In addition to "regular" instruments, you get what Apple calls Smart Instruments, which cover guitar, bass, keyboards, drums, and orchestral strings. While they seem designed for avoiding wrong notes, I found them to be a wellspring of jump-starters for song ideas. All but the drums have note and chord modes. Note mode lets you play pre-determined scales and bend notes realistically on fretted instruments; chord mode allows one-finger play of up to eight chords onscreen. You set chords using four "odometer" dials: root, type (major, minor, diminished, augmented, sus2, sus4, and no-third), extensions (sixth to 13th, including major seventh and ninths with and without the dominant seventh), and even alternate bass notes for "slash" chords. There are gaps—I could dial in *Amin maj7* over *B* but couldn't get a flat fifth outside of the diminished option, for instance—but the possibilities would still qualify as thorough in a hardware arranger keyboard, let alone a five-dollar app.

Each chord gets a vertical strip. On Smart Keyboards and Strings, touching up and down the strip plays different chord inversions (see Figure 2). The Smart Guitar strums when you slide your finger; the Smart Bass knows enough to walk the notes. Smart Strings (first and second violin, viola, cello, and contrabass—each of which you can tap on and off) offer three articulations: Tap a strip to hear pizzicato, swipe briskly for marcato, or "bow" with your finger to begin a crescendo that gets louder the faster you go. It may not be a four-figure strings library, but there's real arranging power here.

Each Smart Instrument also lets you choose from four auto-play phrases, which latch until you touch the active chord strip a second time. Changing chords mid-phrase requires practice to get the timing right, but once you do, the inner voice movement turns on a dime. Two or three touches on the strip triggers further variations. Auto-play results get recorded to a track in your song.

"Smart" behavior triggers from the screen only; a connected MIDI keyboard will play straight notes. This let me change chords with my left hand on my iPad while playing a line on my controller with my right. The Smart Strings even put a solo violin on my controller while the section auto-played a cinematic-sounding passage behind me.

In the Smart Drums, you drag icons (kick, snare, hat, etc.) onto a grid to make beats. Higher on the vertical axis is louder; farther right horizontally makes that instrument play a

Fig. 3. Changing the articulation of a single note from a Smart Strings passage in the piano-roll editor.

more complex rhythm. You get acoustic and electronic kits, including a more than decent TR-808 homage that gets the signature cowbell right. I got the best results from Smart Drums when I wanted to be pleasantly surprised. If I knew what I was going for (say, a four-on-the-floor kick with snares on beats 2 and 4 and a sixteenth-note hat throughout), the non-Smart drum options got the job done more handily.

Working with Audio

For vocals or anything else you'd point a mic at, GarageBand offers an audio recorder with a cool analog-style VU meter. After making a recording pass, you can add an effect, though this happens on the Audio Recorder "instrument" screen, not plug-in-style in the song view. Effects comprise three reverbs plus vocal tricks such as telephone, robot, bullhorn, chipmunk, and monster voices.

A separate "instrument" for plugging in a guitar or bass boasts excellent amp and stompbox models. You can create stompbox chains, mix and match them with amps, and save the whole setup as a preset.

Separate from everything discussed so far is the Sampler. You can record a sound, reverse it, loop it, trim the start and end points, and impart an attack-decay-release envelope. You can save your work in a patch browser dedicated to the sampler, but you can't create multisamples mapped to note or velocity ranges on the keyboard. This is meant for one-shot sounds like James Brown going "Hah!"

Editing

The big deal here is a piano-roll editor for instrument (*i.e.*, non-audio) tracks. Double-tap a region in a track, and you get a pop-up of editing options. Touch "Edit," and the piano-roll opens. Touch a note in the piano-roll, and you can tweak its velocity or drag it to change its pitch and/or duration. With recorded Smart Strings, you can change both the instrument (violin, cello, etc.) and articulation *per note*—even inside ensemble passages you recorded using auto-play. Let that sink in: A five-dollar app lets you get almost as surgical about string arranging as a first violinist who's never seen without a bow tie (see Figure 3).

By default, songs are displayed and worked with an eight-bar section at a time. Clicking the plus sign on the song view ruler lets you add more sections (if you work in terms of verse, chorus, bridge, etc.), set each section's length, or see the whole song beginning to end.

Apple Loops that you drag into a track will auto-transpose to the song's global key. Many of the loops are played so as to sound good over basic chord movement like *I-IV-V*, but won't fit if you throw the song a Donald Fagen-league curve. If you import GarageBand songs into Logic, Apple Loops *will* follow changes you specify in Logic's chord track, but currently there's no analogous function in the iOS version. Having chord or key changes at the section level would be one way to go here.

GarageBand for iOS doesn't capture every controller move a pro-level DAW would. In synths, the pitch and mod wheel are recorded, but other knob twists aren't. With organs, Leslie slow/fast switches are but drawbar changes aren't. A lane in the piano-roll lets you edit sustain pedal and Leslie speed messages, though.

Jam Session

This feature tempo-syncs up to four iOS devices over WiFi (if you're near an open router) or Bluetooth (if you're not) to form a "band" and record the results. The person who created the session is the bandleader, and can opt to control tempo and transport. When you're done, the bandleader's device imports and saves all the tracks.

I divided Smart Drums, organ, Smart Guitar, Smart Strings, and a recorded vocal between my original and third-gen iPads and iPhone 4, and to my surprise heard no latency or audio glitches. Since each device does its own audio and MIDI heavy lifting, and since the bandleader's track aggregation happens after you hit stop, the only thing that uses wireless bandwidth when you're jamming is the sync that keeps everyone marching to the same drummer. Clever!

Conclusions

I always loved the way Monty Python worked on two levels: Any six-year-old will laugh at grown men dressed like frumpy housewives and speaking in falsetto, but what they're saying makes grad students feel hip for getting the joke. GarageBand on iOS is like that: There's a depth that screams to be used if you know why you need it, but gets out of your way if you don't. That's why it's in this month's table of contents as a DAW, not merely an "app." Though it works the same on all iOS devices, the large screen of an iPad—especially a Retina model—makes for the best experience.

Sure, there are significant omissions compared to a "real" DAW. More time signatures, mix automation, provision for tempo and chord changes within a song, and more than eight tracks (though you can bounce tracks) are biggies. But Apple has a line to walk here between adding features and keeping the workflow friendly, and in my opinion, they're making good choices. Considering all GarageBand *does* do, iOS integrates the elements of sight and touch so well that you really can create polished productions on an airline tray table—and I've seen a lot of things fall short on similar claims. GarageBand for iOS would be a steal at 50 dollars, let alone the comically low five bucks Apple asks. ♫

Bottom Line

No other mobile app offers this complete and integrated a set of virtual instruments and recording tools for multitrack composition.

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GALAXY INSTRUMENTS

Galaxy X

BY MARTY CUTLER

ONE COOL ASPECT OF SYNTHS IS THAT THEY LET US MAKE SOUNDS THAT are completely the product of our imaginations. You probably know about convolution reverb, which imparts the characteristics of real acoustic spaces onto your audio. Galaxy X is a synth that asks: Why use convolution for just reverb? Why not use it to impart the characteristics of one *instrument* onto another, getting entirely new sounds from the mashup?

Sound Engine

Best Service's "Engine"—a deeply programmable sampler—drives Galaxy X, but the Quick Edit page holds most of what makes Galaxy X unique. Once you've loaded a patch from the browser, the display changes from Engine's generic, assignable controls to Galaxy X-specific parameters. These are divided into four quadrants—Sources, Pre-X, X, and Post-X, and the signal flow runs counter-clockwise beginning with Sources.

Snap Judgment

PROS Wildly imaginative sounds with oodles of harmonic movement and animation. Quick Edit makes it simple to create countless variations. Imports user samples.

CONS Interface freezes when left dormant for a long time. Patches are not recalled when a song is reloaded.

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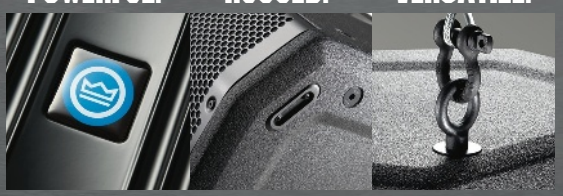

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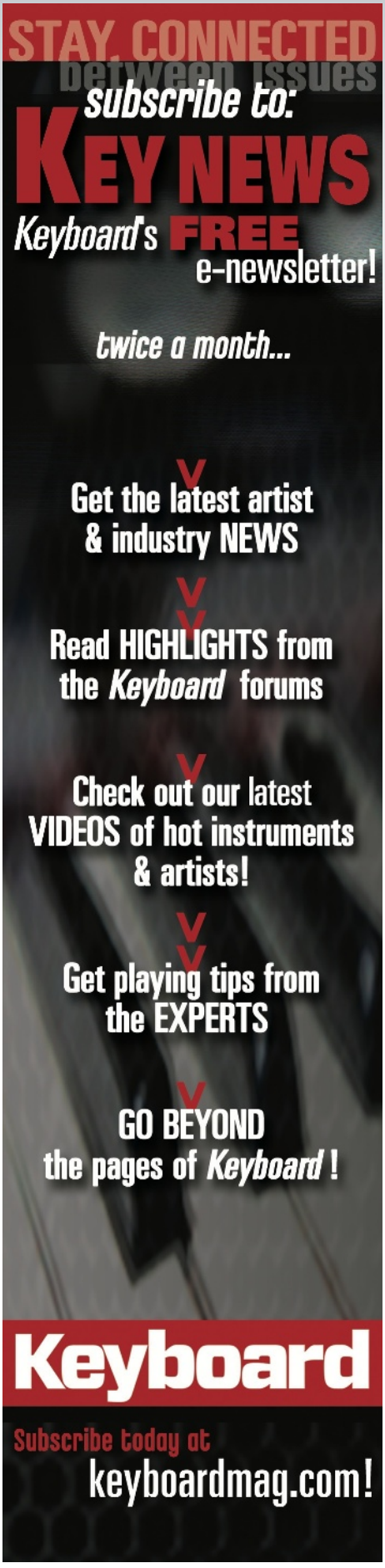

The Sources section offers drop-down menus to choose multisamples for each of the three oscillators, and you can adjust their individual levels upstream of any convolution. Click the Pro Edit tab, and you'll be able to add your own audio in WAV or AIFF formats (up to 25 samples per source).

The Pre-X area combines DSP with the instrument's tempo-synced sequence and groove capabilities. That might seem backwards, but the idea here is audio and MIDI pre-treatment of the sample source material. The section further subdivides into several areas. Switch on the Dirt button, and you can mangle samples with knobs for distortion (Blast), bit-crushing (Crush), or sample-rate reduction (Ruin). You can create some pretty drastic tones here, and although summing the effect to all three sources is useful, the option of applying Dirt to individual oscillators would be better still.

Also in the Pre-X quadrant are the Sequence and Groove drop-down menus, which deliver tons of rhythmic variety. In conjunction with the Groove menu, you can create pulsing chords layered with the arpeggiator for complex polyrhythms. The permutations multiply when you consider that the Galaxy engine lets you layer as many patches as your processor and RAM can stand. A Contour button helps shape the transients of the samples. Adding to the rhythmic mayhem is a stereo delay-and-filter effect. Like the grooves and sequences, it can sync to tempo. You can change the rhythms for left and right delays, and dial in the number of repeats.

The X Files

The heart of Galaxy X is the X section. Here, you get a pull-down menu with scads of impulse responses (IRs) and controls to shape their sway over the three source multisamples. The IR files are a wildly varied lot, ranging from delays and rhythmically filtered synth waveforms, to vocals, cymbals, and even swarms of bees. It's often hard to predict what the resulting convolution will sound like, but I got some strange and wonderfully eerie music when convolving the bee swarms with some of the world-music Sources. The results were a perfect choice for Lovecraft-inspired film scoring—listen to clip 1 of the web audio at keyboardmag.com/january2013.

The Post-X section finishes off the patch with reverb, filter, and panning, but their controls go beyond conventional shaping. For instance, Rotate (the subsection governing pan controls) offers models of grooves in different time signatures, multiple waveforms, and other complex shapes. Think of these as vectors, as in the Prophet VS or Korg Wavestation, providing additional tempo-synced control over the already-processed patches—and upping the polyrhythmic ante.

Convolution comes front-and-center again with Space: a drop-down menu offering surreal and strange ambiences taken from instruments, caves, and piano innards, alongside conventional reverb from natural spaces, spring reverb, and vintage processors.

Factory Sounds

Galaxy X is rife with otherworldly tones, divided into three main folders: FX, Keys, and Loops. Each main folder subdivides based on recognizable applications such as pads, bowed instruments, or loops.

The "Atmospheres" subfolder in the FX group will be a great resource for game and film sound design. The X-File controls created some fascinating rolls of the dice here, just by selecting a new IR. Be sure to audition the entire range of the keymap, though; you may uncover (as with most loops) a different set of samples, such as pads, vocal motifs, instruments, or one-shot samples.

The Keys library is stuffed with folders of unusual pads, burbling leads, organs, pianos, and things that defy description. Among my favorites here is "Harmonics of a Koto," which sounds as if you're listening to the instrument from *inside* it. It bears repeating that everything can change with the twist of a knob; a slight dial-back of the convolution on the beautiful "Plucked Belliano" resulted in a much more useful sound. Also, the "Blips and Blops" folder is a haven for IDM and glitch.

Conclusions

Galaxy X is a remarkable sound design tool. You can get as complex as you like, but a wealth of sound-sculpting power is right under your nose. The one operating problem I experienced was that if it's left dormant for a long period of time, all user interface functions—including knobs animated by MIDI input and access to other pages—freeze up. Sound-wise, everything continues to work. The Galaxy folks are working on solutions. Still, I'm awestruck at the potential for unique, animated sounds. Galaxy X is one of a kind. ♫

Bottom Line

Despite some rough edges, Galaxy X easily provides sounds you haven't heard before. For film, TV, or game music requiring an edge, it's a monster.

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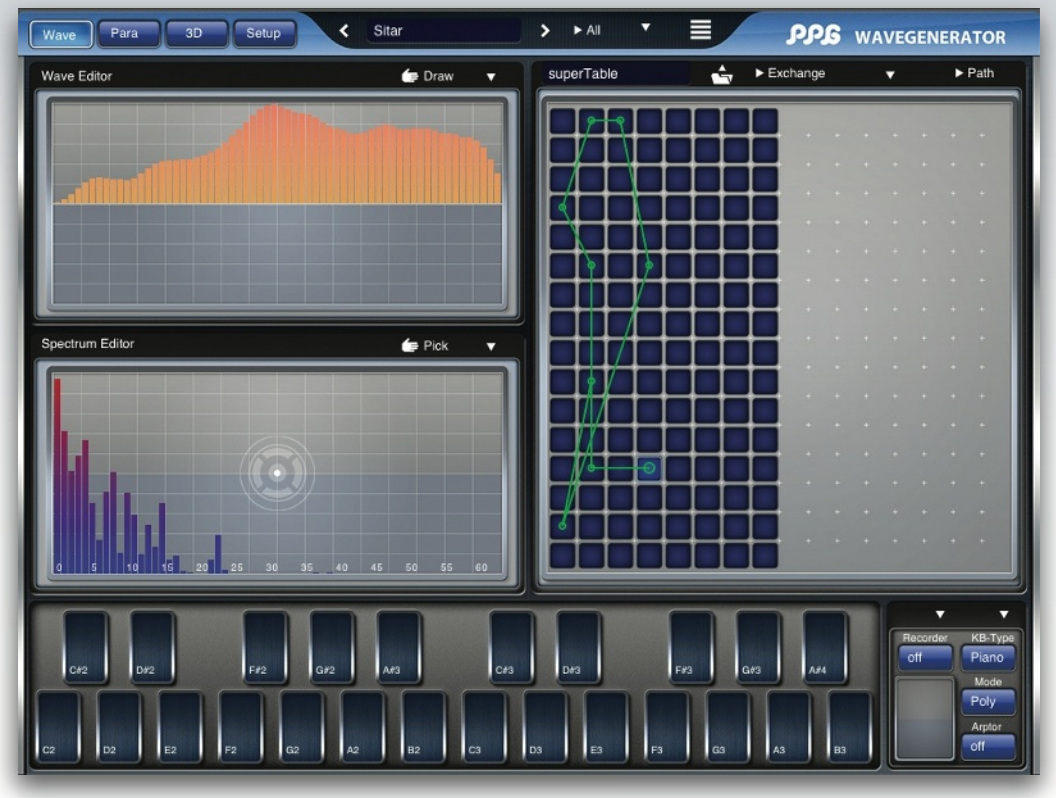

WOLFGANG PALM

PPG WaveGenerator

BY FRANCIS PRÈVE

ONE OF THE COOLEST TRENDS IN IOS SOFT SYNTHS IS THE RETURN of legendary digital synthesizer designers, making affordable new instruments that are truly powerful. PPG WaveGenerator is a brand new synth by Wolfgang Palm, who invented wavetable synthesis with the groundbreaking PPG Wave back in 1981.

WaveGenerator takes the concept behind the original Wave and ratchets everything up, with stunning visual tools that let users design their own wavetables from scratch. From there, these wavetables can be sequenced and automated, resulting in evolving textures that sound like nothing else in the current iOS ecosystem—and that's saying a lot.

The architecture is deep and thorough. There are three wavetable oscillators that you can freely edit by simply drawing their harmonic spectrum with your finger. What's more, the synth even lets you import pictures from your photo library, which are then converted to wave slices via Fourier-based additive tools. Each oscillator also includes tuning, wavetable offset, blending (for smoother transitions between each wavetable slice), and modulation options galore.

The oscillators feed a lowpass filter that has a deliciously vintage vibe with overdrive options and some of the juiciest resonance I've encountered in an iOS synth. At the end of the signal chain is a dual amplifier for mixing both the filtered signal and a second audio source, like direct oscillator outputs or any of its three noise sources. This is a little subtle for most users, but for hardcore sound designers, it's a terrific resource.

Modulation tools abound. There are dedicated multi-stage (and looping) envelopes for each oscillator's pitch and wavetable, the noise generators, filter cutoff, dual amp inputs, and panning. Other resources include three dedicated pitch LFOs and an extra LFO for auto-panning, along with a load of MIDI options for live performance.

With all these synthesis tools literally at your fingertips, building your own patches from scratch will be a labor of love for those with the necessary time and skill. If you'd rather get right to playing, WaveGenerator comes with a huge array of patches that sound great on their own, or serve as starting points for your own endeavors.

After spending a couple of weeks with WaveGenerator, I can honestly say that this is one of the coolest iPad synths on the market and well worth the 20 bucks. Welcome back, Wolfgang. We missed you!

Snap Judgment

PROS Phenomenally deep wavetable synthesis tools. Many parameters are graphically editable, which makes experimentation fun. Gorgeous interface. Built-in help for each synthesis section.

CONS So detailed and complex that novices may get a tad lost in the navigation.

BOTTOM LINE One of the best iPad synths we've yet seen.

$19.99

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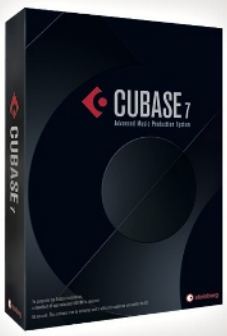

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5 THINGS I'VE LEARNED ABOUT Being a Sideman

Brian with (from left) Hohner Clavinet D6 atop Rhodes Stage Mark I, three squeeze boxes, Wurlitzer, and Yamaha upright piano. Visit him at brianmitchellmusic.com.

BY BRIAN MITCHELL

I'VE SPENT MY LIFE AS A WORKING MUSICIAN, SPLITTING MY TIME BETWEEN sideman duties for such artists as Bob Dylan and Levon Helm, and leading my own bands. I've always tried to find sideman gigs where I can feel connected and creative in some way or another. Here are five things I've learned about being a better live and session player.

1. Be a Singer

A singer I was accompanying on piano once asked me if I sang, to which I replied that I never gave it much thought. He told me that if I started, I'd always have more work than if I just played piano. So began my journey of singing, growling, and yelling into mics and effects boxes. Anyone can sing—it's just a matter of finding material that suits your voice and personality.

2. Be Diverse

As a teenager living in Miami, Florida, I was playing piano in a southern rock band while simultaneously playing funk, R&B, and even disco with another. Each band gave me hell for playing with the other, but for me it's always been about playing with great musicians, regardless of their style or scene. That's how you grow.

3. Be Multi-Instrumental

A nefarious acquaintance once owed me money and all he could offer me in payment was a beat-up red accordion, complete with a bullet hole in the front that gave it a certain attitude. I picked it up and I've been getting calls to play it ever since! I also once did a session where the producer wanted a chromatic harmonica part for a song. I was able to pull it off, and to this day, I still get calls to play harmonica.

4. Be Prepared

I was recently called for Brazilian Forró gig on accordion, and I researched the music online and through recordings. I also traced its historical and geographical influences and began to see similarities between Forró and Zydeco. That made it easier to capture the right vibe. You never know what gig you may get next, so always investigate new styles.

5. Be Kind or Be Gone

If I've learned anything at all, it's simply to be kind. If you're unbearable to be around, there will always be someone ready to take your place at the drop of a hat. Save the attitude for your instrument, or you might just talk your way out of a gig!

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